

=> FIL REG

FILE 'REGISTRY' ENTERED AT 13:08:44 ON 16 AUG 2010
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=> D HIS NOFILE

FILE 'HCAPLUS' ENTERED AT 09:18:10 ON 16 AUG 2010

E US2006-581005/APPS

L1 1 SEA SPE=ON ABB=ON PLU=ON US2006-581005/AP

E DE2003-10357315/APPS

L2 1 SEA SPE=ON ABB=ON PLU=ON (DE2003-10357315/AP OR
DE2003-10357315/PRN)

L3 1 SEA SPE=ON ABB=ON PLU=ON (L1 OR L2)
SEL L3 RN

FILE 'REGISTRY' ENTERED AT 09:29:50 ON 16 AUG 2010

L4 16 SEA SPE=ON ABB=ON PLU=ON (435293-93-9/BI OR 7439-98-7/BI

FILE 'HCAPLUS' ENTERED AT 09:33:13 ON 16 AUG 2010

SEL L3 AU

L5 153 SEA SPE=ON ABB=ON PLU=ON ("GERHARD, ANJA"/AU OR
"STOESSEL, PHILIPP"/AU OR "VESTWEBER, HORST"/AU)
E MERCK/CO

L6 42517 SEA SPE=ON ABB=ON PLU=ON (MERCK+ALL/CO,CS,PA OR "MERCK

L7 24168 SEA SPE=ON ABB=ON PLU=ON ("MERCK INST"+ALL/CO,CS,PA OR

L8 12827 SEA SPE=ON ABB=ON PLU=ON ("MERCK SERONO ANALYTICAL

L9 45049 SEA SPE=ON ABB=ON PLU=ON (L6 OR L7 OR L8)

L10 214161 SEA SPE=ON ABB=ON PLU=ON (ELECTROLUM!N? OR ORGANOLUM!N?
OR (ELECTRO OR ORGANO OR ORG#)(2A)LUM!N? OR LIGHT?(2A)(EMIT
? OR EMISSION?) OR EL OR E(W)L OR L(W)E(W)D OR OLED)/BI,AB
OR LED/IT

L11 2614 SEA SPE=ON ABB=ON PLU=ON HOLE? (2A) BLOCK?

L12 1081 SEA SPE=ON ABB=ON PLU=ON L10 AND L11

FILE 'REGISTRY' ENTERED AT 09:50:53 ON 16 AUG 2010

L13 TRA PLU=ON L10 1- RN : 50344 TERMS

L14 50344 SEA SPE=ON ABB=ON PLU=ON L13

FILE 'LREGISTRY' ENTERED AT 10:07:03 ON 16 AUG 2010

L15 STR

FILE 'REGISTRY' ENTERED AT 10:10:55 ON 16 AUG 2010

L16 50 SEA SUB=L14 SSS SAM L15

L17 5957 SEA SUB=L14 SSS FUL L15

L18 1348973 SEA SPE=ON ABB=ON PLU=ON PMS/CI

L19 4863 SEA SPE=ON ABB=ON PLU=ON L17 NOT L18

FILE 'HCAPLUS' ENTERED AT 10:15:13 ON 16 AUG 2010

L20 4934965 SEA SPE=ON ABB=ON PLU=ON L19

L21 19741 SEA SPE=ON ABB=ON PLU=ON L20 AND L10

L22 24567 SEA SPE=ON ABB=ON PLU=ON PHOSPHORESC?

L23 848 SEA SPE=ON ABB=ON PLU=ON L21 AND L22

L24 2614 SEA SPE=ON ABB=ON PLU=ON HOLE? (2A) BLOCK?

L25 44 SEA SPE=ON ABB=ON PLU=ON L23 AND L24

L26 QUE SPE=ON ABB=ON PLU=ON BLOCKER? OR BLOCKING?

L27 54 SEA SPE=ON ABB=ON PLU=ON L23 AND L26

L28 54 SEA SPE=ON ABB=ON PLU=ON L25 OR L27

August 16, 2010

10/581,005

2

L29 5 SEA SPE=ON ABB=ON PLU=ON L28 AND (L5 OR L9)
L30 49 SEA SPE=ON ABB=ON PLU=ON L28 NOT L29
L31 6 SEA SPE=ON ABB=ON PLU=ON 1808-2003/PY,PRY,AY AND L30

FILE 'REGISTRY' ENTERED AT 11:25:31 ON 16 AUG 2010

L32 TRA PLU=ON L10 1- RN : 50344 TERMS
L33 50344 SEA SPE=ON ABB=ON PLU=ON L32
L34 TRA PLU=ON L10 17724- RN : 50441 TERMS
L35 50441 SEA SPE=ON ABB=ON PLU=ON L34
L36 TRA PLU=ON L10 29850- RN : 50331 TERMS
L37 50330 SEA SPE=ON ABB=ON PLU=ON L36
L38 TRA PLU=ON L10 62259- RN : 50310 TERMS
L39 50310 SEA SPE=ON ABB=ON PLU=ON L38
L40 TRA PLU=ON L10 95581- RN : 50058 TERMS
L41 50058 SEA SPE=ON ABB=ON PLU=ON L40
L42 TRA PLU=ON L10 122529- RN : 50729 TERMS
L43 50729 SEA SPE=ON ABB=ON PLU=ON L42
L44 TRA PLU=ON L10 138684- RN : 50172 TERMS
L45 50172 SEA SPE=ON ABB=ON PLU=ON L44
L46 TRA PLU=ON L10 159547- RN : 50301 TERMS
L47 50301 SEA SPE=ON ABB=ON PLU=ON L46

FILE 'HCAPLUS' ENTERED AT 12:56:51 ON 16 AUG 2010

L48 TRA PLU=ON L10 206698- RN : 8275 TERMS

FILE 'REGISTRY' ENTERED AT 12:58:26 ON 16 AUG 2010

L49 8274 SEA SPE=ON ABB=ON PLU=ON L48
L50 327725 SEA SPE=ON ABB=ON PLU=ON L33 OR L35 OR L37 OR L39 OR
L41 OR L43 OR L45 OR L47 OR L49
L51 50 SEA SUB=L50 SSS SAM L15
L52 59833 SEA SUB=L50 SSS FUL L15
SAV L52 CLA005/A
L53 59832 SEA SPE=ON ABB=ON PLU=ON L52/COM
L54 48759 SEA SPE=ON ABB=ON PLU=ON L53 NOT L18

FILE 'HCAPLUS' ENTERED AT 13:01:24 ON 16 AUG 2010

L55 QUE SPE=ON ABB=ON PLU=ON L54
L56 26804 SEA SPE=ON ABB=ON PLU=ON L10 AND L55
L57 15430 SEA SPE=ON ABB=ON PLU=ON L54 (L) L26
L58 84 SEA SPE=ON ABB=ON PLU=ON L56 AND L57
L59 15 SEA SPE=ON ABB=ON PLU=ON L58 AND L22
L60 469 SEA SPE=ON ABB=ON PLU=ON L56 AND L26
L61 70 SEA SPE=ON ABB=ON PLU=ON L60 AND L22
L62 5 SEA SPE=ON ABB=ON PLU=ON L61 AND (L5 OR L9)
L63 65 SEA SPE=ON ABB=ON PLU=ON L61 NOT L62
L64 10 SEA SPE=ON ABB=ON PLU=ON 1808-2003/PY,PRY,AY AND L63

FILE 'REGISTRY' ENTERED AT 13:08:44 ON 16 AUG 2010

=> D L52 QUE STAT

L10 214161 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON (ELECTROLUM!N? OR
ORGANOLUM!N? OR (ELECTRO OR ORGANO OR ORG#) (2A) LUM!N? OR
LIGHT? (2A) (EMIT? OR EMISSION?) OR EL OR E(W) L OR L(W) E(W) D
OR OLED) /BI,AB OR LED/IT
L15 STR

G1=G2
1=2

VAR G1=C/S/P

VAR G2=O/S

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 2

STEREO ATTRIBUTES: NONE

L32 TRANSFER PLU=ON L10 1- RN : 50344 TERMS
L33 50344 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L32
L34 TRANSFER PLU=ON L10 17724- RN : 50441 TERMS
L35 50441 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L34
L36 TRANSFER PLU=ON L10 29850- RN : 50331 TERMS
L37 50330 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L36
L38 TRANSFER PLU=ON L10 62259- RN : 50310 TERMS
L39 50310 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L38
L40 TRANSFER PLU=ON L10 95581- RN : 50058 TERMS
L41 50058 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L40
L42 TRANSFER PLU=ON L10 122529- RN : 50729 TERMS
L43 50729 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L42
L44 TRANSFER PLU=ON L10 138684- RN : 50172 TERMS
L45 50172 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L44
L46 TRANSFER PLU=ON L10 159547- RN : 50301 TERMS
L47 50301 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L46
L48 TRANSFER PLU=ON L10 206698- RN : 8275 TERMS
L49 8274 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L48
L50 327725 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L33 OR L35 OR
L37 OR L39 OR L41 OR L43 OR L45 OR L47 OR L49
L52 59833 SEA FILE=REGISTRY SUB=L50 SSS FUL L15

100.0% PROCESSED 156321 ITERATIONS (1 INCOMPLETE) 59833 ANSWERS
SEARCH TIME: 00.00.01

=> FIL HCAP

FILE 'HCAPLUS' ENTERED AT 13:08:59 ON 16 AUG 2010

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=> D L62 1-5 IBIB ABS HITSTR HITIND RETABLE

L62 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2010:629008 HCAPLUS Full-text

DOCUMENT NUMBER: 152:592160

August 16, 2010

10/581,005

4

TITLE: Group IVA element arylamido complexes as materials for organic electroluminescent devices

INVENTOR(S): Stoessel, Philipp; Heil, Holger; Joosten, Dominik; Pflumm, Christof; Gerhard, Anja

PATENT ASSIGNEE(S): Merck Patent G.m.b.H., Germany

SOURCE: PCT Int. Appl., 77pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010054729	A2	20100520	WO 2009-EP7361	20091014
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
DE 102008056688	A1	20100512	DE 2008-102008056688	20081111
PRIORITY APPLN. INFO.:			DE 2008-102008056688A	20081111

OTHER SOURCE(S): MARPAT 152:592160

AB Group IVA element compds., M[R2N-R1A-R1B(R1D-R1E)qY]mR44-2m [1, M = Si, Ge, Sn, Ti, Zr, Hf, preferably M = Si; R4 = alkyl, aryl; m = 1, 2; q = 0, 1; A, B, D, E = double- or single-bonded carbon, A-B and/or E-Y may be a part of an aromatic ring; Y = amino, O, S; R1 = H, halo, CN, NO2, amino, C1-40 alkyl, alkoxy, alkylthio, alkenyl, (hetero)aryl, aryloxy; R2 = alkyl, cycloalkyl, (hetero)aryl], complexes M[R2N-R1A-R1B(R1D-R1E)qY]mR46-2m (M = Cr, Mo, W) preferably compds. 1 are non-porphyrinato or porphyrinato-like, useful as electron- or exciton-blocking matrix materials for light-emitting layers of electroluminescent devices, were prepared (M = Si) by reaction of the corresponding deprotonated amines with Si precursors SiCl4, R42SiCl2 and tested as additives for electron-blocking layers and light-emitting layers (3-30%), which substantially increased efficiency of phosphorescent substances, such as tris(phenylpyridine)iridium. In an example, reaction of 300 mmol of the diamine Q(NHAr)2 (Q = 1,2-C6H4, 4,5-Me2-1,2-C6H2, 1,1'-biphenyl-2,2-diyl; Ar = Ph, MeC6H4, PhC6H4) with 600 mmol of BuLi in 2 L of Et2O followed by addition of 150 mmol of SiCl4 gave compds. 1, Si[Q(NAr2)]2 (1a, same Q, Ar) with 27-61% yields. In another example, an organic light-emitting device (OLED), having the compound 1, Si[1,2-C6H4(NPh)2]2 (1b) as a electron-blocking layer and as a dopant to light-emitting layer, consisting of bis(1,1':3',1'':3'',1''':3''',1''''-quinquephenyl-5''-yl)methanone (M1), doped with 10% of 1b and 10% of tris(2-phenylpyridine)iridium, showed an efficiency of 54 cd/A, compared to 32.8 cd/A for similar device without 1b.

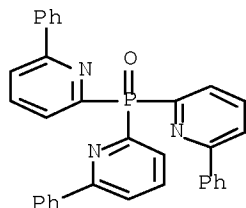
IT 197776-46-8, Tris(6-phenyl-2-pyridinyl)phosphine oxide
1205555-94-7

(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers,

dopants for OLED light-emitting
layers)

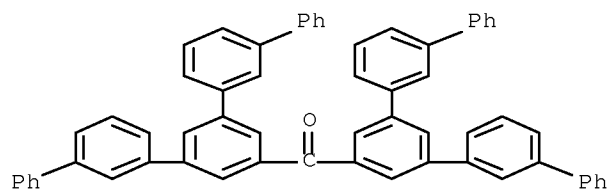
RN 197776-46-8 HCAPLUS

CN Pyridine, 2,2',2''-phosphinylidynetris[6-phenyl- (9CI) (CA INDEX
NAME)



RN 1205555-94-7 HCAPLUS

CN Methanone, bis([1,1':3',1'':3'',1''':3''',1''''-quinquephenyl]-5''-yl)-
(CA INDEX NAME)



IPCI C09K0011-06 [I,A]

IPCR C09K0011-06 [I,C]; C09K0011-06 [I,A]

CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 73, 76

ST silicon amide arylamine prepn electron exciton blocking
dopant OLED; chelate silicon tetramido arylamine complex
prepn electroluminescent device dopant;
electroluminescent device efficiency improvement silicon
tetramido complex

IT Amines

(aryl, silicon complexes; preparation of silicon chelate tetramides and
diorganosilane diamides as additives for electron- and exciton-
blocking layers, dopants for OLED light
-emitting layers)

IT Amines

(diamines, aromatic, silicon complexes; preparation of silicon chelate
tetramides and diorganosilane diamides as additives for electron-
and exciton-blocking layers, dopants for OLED
light-emitting layers)

IT Electrochemical cells

(light-emitting, organic; preparation of silicon
chelate tetramides and diorganosilane diamides as additives for
electron- and exciton-blocking layers, dopants for
OLED light-emitting layers)

IT Plasmon

(organic plasmon-emitting devices; preparation of silicon chelate

- tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT Field effect transistors
Optical detectors
Optical integrated circuits
Semiconductor lasers
Solar cells
Thin film transistors
(organic; preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT Deprotonation
Electroluminescent devices
Electrophotographic photoconductors (photoreceptors)
Phosphorescent substances
(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT Group IVA element compounds
(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT Chelates
(silicon; preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT 1206465-62-4P 1225231-03-7P 1225231-04-8P 1225231-05-9P
(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT 2085-33-8, Tris(8-quinolinolato)aluminum 50926-11-9, Indium tin oxide 123847-85-8 126213-51-2, Poly(3,4-ethylenedioxy-2,5-thiophene) 197776-46-8, Tris(6-phenyl-2-pyridinyl)phosphine oxide 359014-71-4 376367-93-0 613682-85-2 693794-98-8 1205555-94-7 1227140-78-4 1227140-79-5
(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT 62-53-3, Aniline, reactions 75-78-5, Dichlorodimethylsilane 80-10-4, Dichlorodiphenylsilane 92-67-1, [1,1'-Biphenyl]-4-amine 106-49-0, p-Toluidine, reactions 108-44-1, m-Toluidine, reactions 134-32-7, 1-Naphthalenamine 583-53-9, 1,2-Dibromobenzene 2243-47-2, [1,1'-Biphenyl]-3-amine 13029-09-9 15810-15-8, 9,10-Dibromophenanthrene 18030-58-5, 9,9-Dichloro-9-silafluorene 24932-48-7
(preparation of silicon chelate tetramides and diorganosilane diamides as additives for electron- and exciton-blocking layers, dopants for OLED light-emitting layers)
- IT 28394-83-4P 29325-52-8P 147850-52-0P 253334-40-6P 956471-82-2P 1225230-99-8P 1225231-00-4P 1225231-01-5P 1225231-02-6P
(preparation of silicon chelate tetramides and diorganosilane diamides

as additives for electron- and exciton-blocking layers,
dopants for OLED light-emitting
layers)

IT 1225231-06-0P 1225231-07-1P 1225231-08-2P 1225231-09-3P
1225231-10-6P 1227140-75-1P 1227140-76-2P 1227140-77-3P
(preparation of silicon chelate tetramides and diorganosilane diamides
as additives for electron- and exciton-blocking layers,
dopants for OLED light-emitting
layers)

L62 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2010:621353 HCAPLUS Full-text

DOCUMENT NUMBER: 152:592162

TITLE: Cyclic arylphosphonic acid derivatives as
supplementary materials for organic
electroluminescent devices

INVENTOR(S): Stoessel, Philipp; Heil, Holger;
Joosten, Dominik; Pflumm, Christof; Gerhard,
Anja; Breuning, Esther; Parham, Amir Hossain

PATENT ASSIGNEE(S): Merck Patent GmbH, Germany

SOURCE: PCT Int. Appl., 101pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

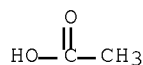
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010054730	A1	20100520	WO 2009-EP7406	20091015
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RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
DE 102008056688	A1	20100512	DE 2008-102008056688	20081111
PRIORITY APPLN. INFO.:			DE 2008-102008056688A	20081111
			DE 2009-102009022858A	20090527

OTHER SOURCE(S): MARPAT 152:592162

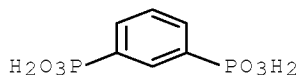
AB Phosphorus heterocyclic compds., preferably diazaphosphole, oxazaphosphole oxides, sulfides [QZ2P(X)]nAr (1, Q = benzo, areno, hetareno, substituted 1,2-ethenediyl, etc.; Z = imino, O, S; X = O, S, preferably X = O; Ar = C6-60 aryl, arylene; n = 1-6, preferably n = 1-3), useful as matrix and/or supplementary materials for organic electroluminescent devices (OLEDs), preferably for blue- and green-emitting OLEDs, based on phosphorescent transition metal complexes, improving performance, efficiency and lifetime of the OLEDs, for making of emitting, electron-, exciton-, or hole-blocking layers, were prepared by heterocyclization of aromatic o-diamines, o-aminophenols Q(AH)2 with phosphonic dichlorides Ar[P(X)Cl2]n, which, in turn were prepared from the corresponding arylphosphonic, arenediphosphonic and

arenetriphosphonic acids. The prepared compds. were tested in model OLEDs by doping the emission and hole- blocking layers, showing increase of efficiency and lifetime of the devices. In an example, 2,2'-(1,4-phenylene)bis(5,6-dimethyl-1,3- diphenyl[1,3,2]benzophosphole) P,P'-dioxide (1a, Q = 4,5-dimethylbenzene-1,2-diyl, Z = NPh, X = O, n = 2, Ar = 1,4-C6H4) was prepared by heterocyclization of 4,5-dimethyl-N,N'-diphenyl-1,2-benzenediamine with 1,4-benzenediphosphonic tetrachloride, Cl2P(O)-1,4-C6H4P(O)Cl2. In another example, the compound 1a, as matrix material doped with 10% tris(3-methyl-2-phenylpyridine)iridium for 30 nm-thick light - emitting layer, showed 57 cd/A efficiency at 1000 cd m⁻² light d. and 560 h lifetime at 4000 cd m⁻² light d., compared with 42 cd/A and 230 h for similar device using bis(9,9'-spirobifluoren-2-yl)phenylphosphine oxide as matrix material.

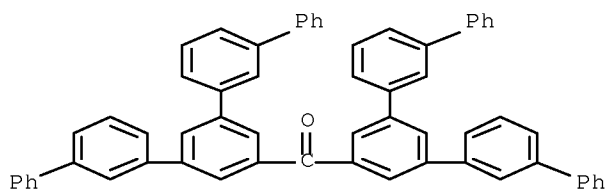
IT 3375-31-3 78271-46-2, Phosphonic acid,
1,3-phenylenebis-
(preparation of cyclic arylphosphonic acid derivs.,
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
organic electroluminescent devices)
RN 3375-31-3 HCAPLUS
CN Acetic acid, palladium(2+) salt (2:1) (CA INDEX NAME)



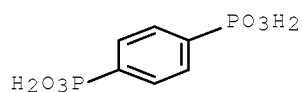
RN 78271-46-2 HCAPLUS
CN Phosphonic acid, P,P'-1,3-phenylenebis- (CA INDEX NAME)



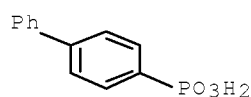
IT 1205555-94-7
(preparation of cyclic arylphosphonic acid derivs.,
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
organic electroluminescent devices)
RN 1205555-94-7 HCAPLUS
CN Methanone, bis([1,1':3',1'':3'',1''':3''',1''''-quinquephenyl]-5''-yl)-
(CA INDEX NAME)



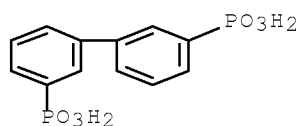
IT 880-68-2, Phosphonic acid, 1,4-phenylenebis-
77918-47-9, Phosphonic acid, 1,1'-biphenyl-4-yl-
108724-77-2, Phosphonic acid, 1,1'-biphenyl-3,3'-diylbis-
(preparation of cyclic arylphosphonic acid derivs.,
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
organic electroluminescent devices)
RN 880-68-2 HCAPLUS
CN Phosphonic acid, P,P'-1,4-phenylenebis- (CA INDEX NAME)



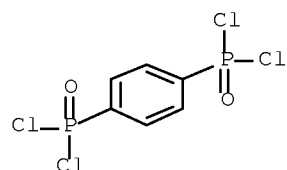
RN 77918-47-9 HCAPLUS
CN Phosphonic acid, P-[1,1'-biphenyl]-4-yl- (CA INDEX NAME)



RN 108724-77-2 HCAPLUS
CN Phosphonic acid, P,P'-[[1,1'-biphenyl]-3,3'-diyl]bis- (CA INDEX NAME)



IT 1227269-53-5P, 1,4-Benzenediphosphonic tetrachloride
(preparation of cyclic arylphosphonic acid derivs.,
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
organic electroluminescent devices)
RN 1227269-53-5 HCAPLUS
CN Phosphonic dichloride, P,P'-1,4-phenylenebis- (CA INDEX NAME)

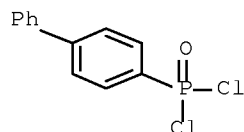


IT 77918-51-5P 1227269-76-2P
1227269-77-3P

(preparation of cyclic arylphosphonic acid derivs.,
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
organic electroluminescent devices)

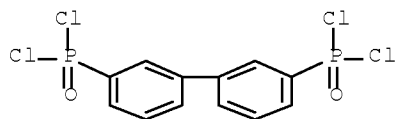
RN 77918-51-5 HCAPLUS

CN Phosphonic dichloride, P-[1,1'-biphenyl]-4-yl- (CA INDEX NAME)



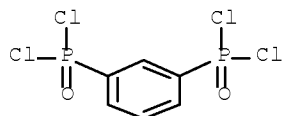
RN 1227269-76-2 HCAPLUS

CN Phosphonic dichloride, P,P'-[1,1'-biphenyl]-3,3'-diylbis- (CA INDEX NAME)



RN 1227269-77-3 HCAPLUS

CN Phosphonic dichloride, P,P'-1,3-phenylenebis- (CA INDEX NAME)



IPCI C09K0011-06 [I,A]

IPCR C09K0011-06 [I,C]; C09K0011-06 [I,A]

CC 29-7 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 73, 76

ST diazaphosphole oxazaphosphole oxide arylphosphonic deriv prepn matrix
material OLED; phosphorus heterocyclic phosphonic diamide
aryl prepn matrix material OLED; phosphonic deriv cyclic
material OLED matrix hole blocking;
heterocyclization arom amine arylphosphonic dichloride diazaphosphole
oxazaphosphole prepn

IT Diphosphonates

Phosphonates

(arylphosphonate derivs.; preparation of cyclic arylphosphonic acid
derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary
materials for organic electroluminescent devices)

- IT Electroluminescent devices
(blue-emitting; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Amines
(diamines, aromatic; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Electroluminescent devices
(green-emitting; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Electrochemical cells
(light-emitting; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Plasmon
(organic plasmon emitting devices; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Field effect transistors
Integrated circuits
Optical detectors
Semiconductor lasers
Solar cells
Thin film transistors
(organic; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Heterocyclic compounds
(phosphorus, 1,3,2-diazaphosphole 2-oxides; preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT Electrophotographic photoconductors (photoreceptors)
Heterocyclization
(preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT 3375-31-3 13716-12-6, Tri-tert-butylphosphine
78271-46-2, Phosphonic acid, 1,3-phenylenebis-
(preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT 1227269-57-9P 1227269-58-0P 1227269-59-1P 1227269-60-4P
1227269-61-5P 1227269-62-6P 1227269-63-7P 1227269-79-5P
(preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT 2085-33-8, Tris(8-quinolinolato)aluminum 25387-93-3,
(8-Quinolinolato)lithium 50926-11-9, Indium tin oxide 58328-31-7
105598-27-4 123847-85-8, 1,1'-Biphenyl-4-4'-diamine,
N,N'-di-1-naphthalenyl-N,N'-diphenyl- 126213-51-2, PEDOT
164724-35-0 359014-71-4 435294-03-4 515834-67-0 561064-11-7
613682-85-2 1205555-94-7 1206465-62-4 1207176-84-8
(preparation of cyclic arylphosphonic acid derivs., benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)
- IT 62-53-3, Aniline, reactions 92-66-0 92-67-1,

[1,1'-Biphenyl]-4-amine 95-53-4, o-Toluidine, reactions 106-49-0,
 p-Toluidine, reactions 504-24-5, 4-Pyridinamine 534-85-0,
 1,2-Benzenediamine, N-phenyl- 583-53-9, 1,2-Dibromobenzene
~~880-68-2~~, Phosphonic acid, 1,4-phenylenebis- 3842-55-5
 10498-56-3, 1,4-Benzenediphosphonous tetrachloride 24932-48-7
 28394-83-4, 1,2-Benzenediamine, N,N'-diphenyl- 38613-89-7,
 Phosphonous dichloride, 1,1'-biphenyl-4-yl- ~~77918-47-9~~,
 Phosphonic acid, 1,1'-biphenyl-4-yl- 82495-68-9,
 1,3-Benzenediphosphonous tetrachloride ~~108724-77-2~~,
 Phosphonic acid, 1,1'-biphenyl-3,3'-diylbis- 1227269-78-4
 (preparation of cyclic arylphosphonic acid derivs.,
 benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
 organic electroluminescent devices)

IT 64436-68-6P 253334-40-6P 773056-31-8P 956471-82-2P
 1225231-00-4P ~~1227269-53-5P~~, 1,4-Benzenediphosphonic
 tetrachloride 1227269-54-6P 1227269-55-7P 1227269-56-8P
 1227269-73-9P 1227269-80-8P 1227269-81-9P
 (preparation of cyclic arylphosphonic acid derivs.,
 benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
 organic electroluminescent devices)

IT ~~77918-51-5P~~ 1227269-64-8P 1227269-65-9P 1227269-66-0P
 1227269-67-1P 1227269-68-2P 1227269-70-6P 1227269-71-7P
 1227269-72-8P 1227269-74-0P 1227269-75-1P ~~1227269-76-2P~~
~~1227269-77-3P~~ 1227269-82-0P 1227269-83-1P 1227269-84-2P
 1227269-85-3P
 (preparation of cyclic arylphosphonic acid derivs.,
 benzo[1,3,2]-diazaphosphole oxides as supplementary materials for
 organic electroluminescent devices)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
=====	=====	=====	=====	=====	=====
Anchisi, C	1979	16	1439	JOURNAL OF HETEROCYC	HCAPLUS
Anisimova	1976	46	807	JOURNAL OF GENERAL C	
Konica Minolta Holdings	2007			JP 2007329495 A	HCAPLUS
Lister, J	1966		1242	JOURNAL OF THE CHEMI	HCAPLUS
Satoshi, O	1995	41	889	HETEROCYCLES	

L62 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2006:1173494 HCAPLUS Full-text

DOCUMENT NUMBER: 145:498536

TITLE: Organic electronic devices and boronic acid and
 boronic acid derivatives used therein

INVENTOR(S): Stoessel, Philipp; Breuning, Esther;
 Buesing, Arne; Parham, Amir; Heil, Holger;
 Vestweber, Horst

PATENT ASSIGNEE(S): Merck Patent G.m.b.H., Germany

SOURCE: PCT Int. Appl., 159pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

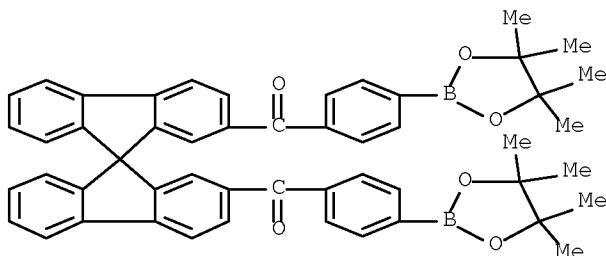
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2006117052	A1	20061109	WO 2006-EP3150	20060406
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,			
	CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,			
	GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,			

KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG,
 MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT,
 RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT,
 TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
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 TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
 ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 EP 1888706 A1 20080220 EP 2006-724095 20060406
 R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR
 JP 2008541417 T 20081120 JP 2008-509318 20060406
 US 20090134384 A1 20090528 US 2007-912939 20071029
 CN 101171320 A 20080430 CN 2006-80015401 20071105
 KR 2008012337 A 20080211 KR 2007-728263 20071203
 PRIORITY APPLN. INFO.: EP 2005-9643 A 20050503
 WO 2006-EP3150 W 20060406

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

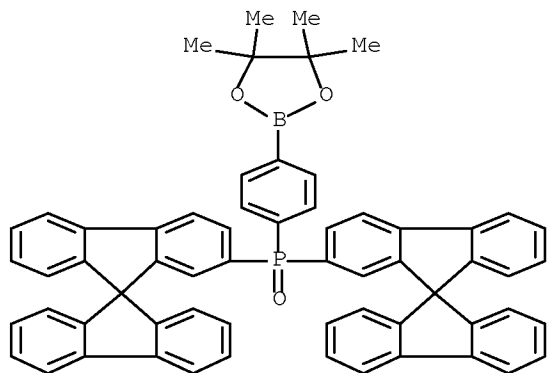
OTHER SOURCE(S): MARPAT 145:498536

- AB Organic electronic devices (e.g., organic or polymer light-emitting diodes, organic field-effect transistors, organic integrated circuits, organic thin-film transistors, organic light-emitting transistors, organic solar cells, organic field quenching devices, organic light-emitting cells, organic photoreceptors, and organic laser diodes) are described which comprise ≥ 1 organic film including ≥ 1 aromatic boronic acid or boronic acid derivative compound. The compds. may serve as fluorescent or phosphorescent dopants, as hole-blocking materials, as hole-transporting materials, or as electron-transporting materials. Oligomeric, dendrimeric, and polymeric compds. of boronic acid or boronic acid derivative compds. are also described. Methods for synthesizing polymers including boronic acid derivs. are described which entail polycondensation of aliphatic or aromatic bis(diols), bis(dithiols), bis(diamines), or similar higher substituted compds. with an aromatic bisboronic acid or higher boronic acid or by reaction of an aromatic compound that includes 2 hydroxy, thiol, or amino groups as well as a boronic acid group.
- IT 914307-04-3P 914307-06-5P
 (organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)
- RN 914307-04-3 HCAPLUS
- CN Methanone, 9,9'-spirobi[9H-fluorene]-2,2'-diylbis[[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]- (9CI) (CA INDEX NAME)



RN 914307-06-5 HCAPLUS

CN Phosphine oxide, 9,9'-spirobi[9H-fluoren]-2-yl-9,9'-spirobi[9H-fluoren]-2'-yl[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]-
(CA INDEX NAME)



IT 64-19-7, Acetic acid, reactions 586-75-4

3762-25-2 25069-38-9,

Bis(4-bromophenyl)(4-formylphenyl)amine 119001-43-3

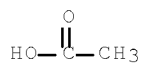
187595-15-9

(organic electronic devices and boronic acid and boronic acid derivs.

used in them and production of polymers including boronic acid-containing groups)

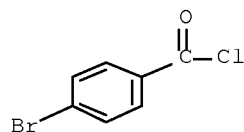
RN 64-19-7 HCAPLUS

CN Acetic acid (CA INDEX NAME)



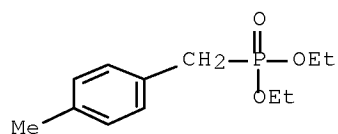
RN 586-75-4 HCAPLUS

CN Benzoyl chloride, 4-bromo- (CA INDEX NAME)



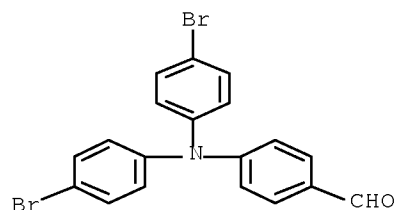
RN 3762-25-2 HCAPLUS

CN Phosphonic acid, P-[(4-methylphenyl)methyl]-, diethyl ester (CA INDEX NAME)



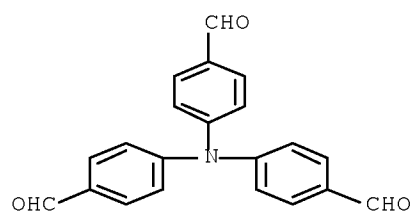
RN 25069-38-9 HCAPLUS

CN Benzaldehyde, 4-[bis(4-bromophenyl)amino]- (CA INDEX NAME)



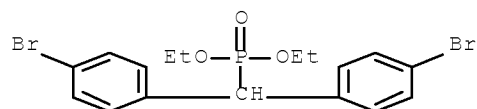
RN 119001-43-3 HCAPLUS

CN Benzaldehyde, 4,4',4''-nitrilotris- (CA INDEX NAME)



RN 187595-15-9 HCAPLUS

CN Phosphonic acid, [bis(4-bromophenyl)methyl]-, diethyl ester (9CI) (CA INDEX NAME)

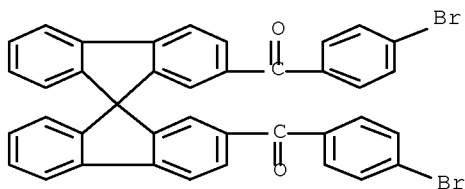


IT 914307-05-4P, 2,2'-Bis(4-bromobenzoyl)spiro-9,9'-bifluorene
914307-07-6P

(organic electronic devices and boronic acid and boronic acid derivs.
used in them and production of polymers including boronic acid-containing
groups)

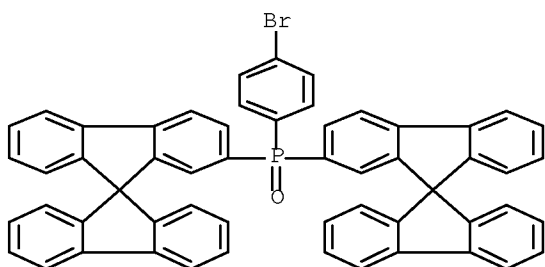
RN 914307-05-4 HCAPLUS

CN Methanone, 9,9'-spirobi[9H-fluorene]-2,2'-diylbis[(4-bromophenyl)-
(9CI) (CA INDEX NAME)



RN 914307-07-6 HCAPLUS

CN Phosphine oxide, (4-bromophenyl)bis(9,9'-spirobi[9H-fluorene]-2-yl)-
(9CI) (CA INDEX NAME)



IPCI C09K0011-06 [I,A]; H05B0033-14 [I,A]; C07F0005-02 [I,A]; C07F0005-05 [I,A]; C07F0005-00 [I,C*]; C07F0015-00 [I,A]

IPCR C09K0011-06 [I,C]; C09K0011-06 [I,A]; C07F0005-00 [I,C]; C07F0005-02 [I,A]; C07F0005-05 [I,A]; C07F0015-00 [I,C]; C07F0015-00 [I,A]; H05B0033-14 [I,C]; H05B0033-14 [I,A]

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 52, 73, 74

ST electronic device boronic acid compd; fluorescent boronic acid compd; phosphorescent boronic acid compd; light emitting diode boronic acid compd; field effect transistor boronic acid compd; integrated circuit boronic acid compd; thin film transistor boronic acid compd; light emitting transistor boronic acid compd; solar cell boronic acid compd; field quenching device boronic acid compd; light emitting cell boronic acid compd; photoreceptor boronic acid compd; laser diode boronic acid compd

IT Electrical materials

Fluorescent substances

Phosphorescent substances

Thin film transistors

(organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)

IT Transistors

(organic light-emitting; organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)

- IT Electroluminescent devices
 Electrophotographic photoconductors (photoreceptors)
 Field effect transistors
 Integrated circuits
 Semiconductor devices
 Semiconductor lasers
 Solar cells
 (organic; organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)
- IT 910244-23-4P 914306-83-5P, 10-(4-Methylnaphth-1-yl)anthracen-9-boronic acid pinacol ester 914306-84-6P 914306-85-7P
 914306-86-8P 914306-88-0P 914306-90-4P 914306-91-5P
 914306-94-8P 914306-95-9P 914306-96-0P 914306-97-1P
 914306-98-2P 914307-03-2P ~~914307-04-3P~~
~~914307-06-5P~~ 914307-08-7P 914307-09-8P 914307-11-2P
 (organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)
- IT ~~64-19-7~~, Acetic acid, reactions 83-53-4,
 1,4-Dibromonaphthalene 84-65-1, Anthraquinone 90-11-9,
 1-Bromonaphthalene 120-80-9, Pyrocatechol, reactions 121-43-7,
 Trimethyl borate 128-08-5, N-Bromosuccinimide 159-66-0,
 Spiro-9,9'-bifluorene 523-27-3, 9,10-Dibromoanthracene 583-53-9,
 1,2-Dibromobenzene ~~586-75-4~~ 611-24-5,
 2-Methylaminophenol 620-93-9, Bis(4-methylphenyl)amine 633-70-5,
 2,6-Dibromoanthraquinone 918-21-8 1564-64-3, 9-Bromoanthracene
~~3762-25-2~~ 7726-95-6, Bromine, reactions 15546-43-7,
 N,N,N',N'-Tetraphenylbenzidine 25015-63-8, Pinacolborane
~~25069-38-9~~, Bis(4-bromophenyl)(4-formylphenyl)amine
 58328-31-7 85199-06-0, 2,5-Dimethylphenylboronic acid 100622-34-2,
 9-Anthracene boronic acid 113040-41-8, Dibromopyrene
~~119001-43-3~~ ~~187595-15-9~~ 454454-92-3
 613682-84-1 914306-87-9 914450-89-8
 (organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)
- IT 70430-42-1P 99372-95-9P 103986-53-4P 113664-24-7P,
 N,N,N',N'-Tetra(4-bromophenyl)benzidine 177799-11-0P 426218-39-5P,
 9,10-Bis(4-bromonaphth-1-yl)anthracene 560107-57-5P,
 1,2-Bis(anthracen-9-yl)benzene 597570-70-2P 663954-33-4P,
 1,6-Bis[(4-methylphenyl)amino]pyrene 756899-77-1P,
 1,4-Bis(anthracen-9-yl)naphthalene 910244-27-8P,
 1,2-Bis(10-bromoanthracen-9-yl)benzene 912483-18-2P 912483-19-3P
 914306-89-1P, 2,6-Dibromo-9,10-bis(naphth-1-yl)anthracene
 914306-92-6P, 1,6-Bis(2,5-dimethylphenyl)pyrene 914306-93-7P,
 1,6-Bis(2,5-dimethylphenyl)-3,8-dibromopyrene 914307-00-9P
 914307-02-1P ~~914307-05-4P~~,
 2,2'-Bis(4-bromobenzoyl)spiro-9,9'-bifluorene ~~914307-07-6P~~
 914307-10-1P, 1,6-Bis[(4-methylphenyl)amino]-3,8-dibromopyrene
 914307-12-3P, 9,10-Bis-N,N-[di(4-bromophenyl)amino]anthracene
 (organic electronic devices and boronic acid and boronic acid derivs. used in them and production of polymers including boronic acid-containing groups)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Amann, N	2002	8	4877	CHEMISTRY, A EUROPEA	HCAPLUS
Amann, N	2002		687	SYNLETT	HCAPLUS

Anon	2003	2003		PATENT ABSTRACTS OF	
Anon	2003	2003		PATENT ABSTRACTS OF	
Baumgarten, M	2000	104	1130	JOURNAL OF PHYSICAL	HCAPLUS
Beinhoff, M	2001		3819	EUROPEAN JOURNAL OF	HCAPLUS
Buettelmann, B	2003			US 2003229096 A1	HCAPLUS
Chisso Corporation	2001			EP 1142895 A	HCAPLUS
Chow, H	2002	85	3444	HELVETICA CHIMICA AC	HCAPLUS
Chow, H	2001	66	5042	JOURNAL OF ORGANIC C	HCAPLUS
Covion Organic Semicond	2002			WO 02051850 A	HCAPLUS
Covion Organic Semicond	2002			WO 02052661 A	
Eastman Kodak Company	2005			WO 2005020283 A	HCAPLUS
Finocchiaro, P	1973	95	7029	JOURNAL OF THE AMERI	HCAPLUS
Goswami, A	2004		2635	EUROPEAN JOURNAL OF	HCAPLUS
Ishikura, M	1985	23	2375	HETEROCYCLES	HCAPLUS
Ishiyama, T	1997	201	92	SPECIAL PUBLICATION	HCAPLUS
Kaupp, G	2003	9	4156	CHEMISTRY, A EUROPEA	HCAPLUS
Ken-Tsung, W	2002	67	1041	JOURNAL OF ORGANIC C	
Koch, K	1991	124	2091	CHEMISCHE BERICHTE	HCAPLUS
Koei Chem Co Ltd	2004			JP 2004189705 A	HCAPLUS
Konica Corp	2003			JP 2003031368 A	HCAPLUS
Lg Chem Ltd	2003			WO 03095445 A	HCAPLUS
Michels, J	2003	9	6167	CHEMISTRY, A EUROPEA	HCAPLUS
Modrakowski, C	2001		2143	SYNTHESIS	HCAPLUS
Ramsey, B	2005	690	962	JOURNAL OF ORGANOMET	HCAPLUS
Tirapattur, S	2002	106	8959	JOURNAL OF PHYSICAL	
Treacher, K	2004			US 2004260090 A1	HCAPLUS
Tsung, W	2004			US 2004147742 A1	
Universal Display Corpo	2003			WO 03033617 A	
Wei-Bo, W	2002			US 2002019527 A1	
Wong, K	2002	124	11576	JOURNAL OF THE AMERI	HCAPLUS
Yamashita, M	2000	39	4055	ANGEWANDTE CHEMIE IN	HCAPLUS

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

L62 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:523578 HCAPLUS Full-text

DOCUMENT NUMBER: 143:50534

TITLE: Organic electroluminescent element

INVENTOR(S): Vestweber, Horst; Gerhard, Anja
; Stoessel, Philipp

PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H.,
Germany

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005054403	A1	20050616	WO 2004-EP13312	20041124
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,				
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,				
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,				
KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,				
MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,				
SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,				
VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,				

AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,
DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL,
PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG

DE 10357315	A1	20050707	DE 2003-10357315	20031205
EP 1697483	A1	20060906	EP 2004-798062	20041124
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
CN 1894358	A	20070110	CN 2004-80036011	20041124
JP 2007522645	T	20070809	JP 2006-541841	20041124
US 20070134510	A1	20070614	US 2006-581005	20060526
KR 2006113939	A	20061103	KR 2006-710957	20060603
PRIORITY APPLN. INFO.:			DE 2003-10357315	A 20031205
			WO 2004-EP13312	W 20041124

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

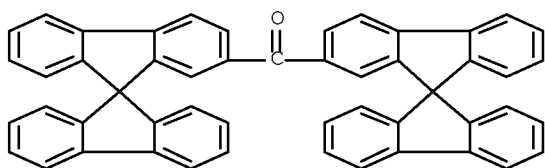
OTHER SOURCE(S): MARPAT 143:50534

AB Organic electroluminescent devices comprising an anode, a cathode, ≥ 1 emitting layer, which consists of ≥ 1 matrix material which is doped with ≥ 1 phosphorescent emitter, and ≥ 1 hole-blocking layer are described which employ compds. including units described by the general formula Y:X (X has ≥ 1 nonbonded electron pair and is selected from NR, O, S, Se, or Te; R = C1-22 organic residue, OH, OR, NH₂ NHR', and NR'₂; R' = H or C1-20 organic residue; and Y = C, P, As, Sb, Bi, S, Se, or Te) as the hole-blocking material, the material being selected so that the hole-blocking and matrix materials are not identical. The use of the compds. in other electronic devices, including organic field-effect and thin-film transistors, organic integrated circuits, organic solar cells, or organic laser diodes is also described, as are the devices.

IT 782504-07-8 782504-10-3 824426-27-9
(devices with hole-blocking materials incorporating
double bonded structural units)

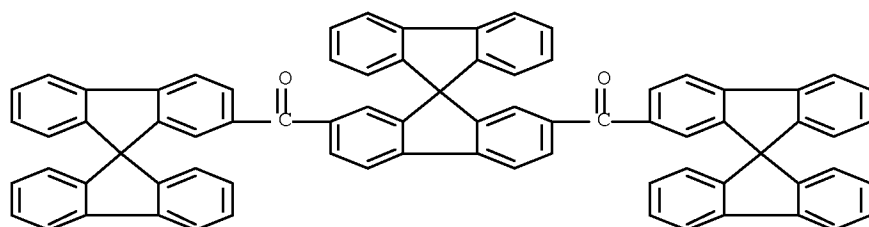
RN 782504-07-8 HCAPLUS

CN Methanone, bis(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



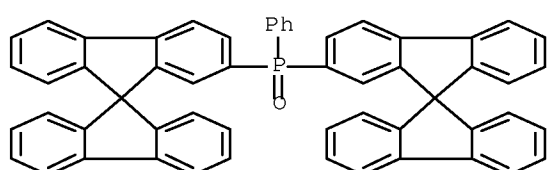
RN 782504-10-3 HCAPLUS

CN Methanone, 9,9'-spirobi[9H-fluorene]-2,7-diylbis[9,9'-spirobi[9H-fluoren]-2-yl]- (9CI) (CA INDEX NAME)



RN 824426-27-9 HCAPLUS

CN Phosphine oxide, phenylbis(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



IPCI C09K0011-06 [ICM,7]; H01L0051-30 [ICS,7]; H01L0051-05 [ICS,7,C*];
H05B0033-14 [ICS,7]; C07F0015-00 [ICS,7]
IPCR C07F0015-00 [I,C*]; C07F0015-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-12
[I,A]; C09K0011-06 [I,C*]; C09K0011-06 [I,A]; H01L0051-00 [I,C*];
H01L0051-00 [I,A]; H01L0051-05 [I,C*]; H01L0051-30 [I,A]; H01L0051-50
[N,C*]; H01L0051-50 [N,A]; H05B0033-14 [I,C*]; H05B0033-14 [I,A]
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 52, 76
ST thin film transistor hole blocking material double bonded
unit; transistor hole blocking material double bonded unit;
org electroluminescent device hole blocking
material double bonded unit; semiconductor laser hole blocking
material double bonded unit; solar cell hole blocking
material double bonded unit; integrated circuit hole blocking
material double bonded unit; FET hole blocking material
double bonded unit; hole blocking material double bonded
unit
IT Thin film transistors
(devices with hole-blocking materials incorporating
double bonded structural units)
IT Imines
Ketones, uses
Phosphazenes
Phosphines
Sulfones
Sulfoxides
(devices with hole-blocking materials incorporating
double bonded structural units)
IT Electroluminescent devices
Field effect transistors
Integrated circuits

Semiconductor lasers

Solar cells

(organic; devices with hole-blocking materials incorporating double bonded structural units)

IT 782504-07-8 782504-10-3 824426-27-9

(devices with hole-blocking materials incorporating double bonded structural units)

IT 7439-98-7D, Molybdenum, compds. 7440-04-2D, Osmium, compds.
 7440-05-3D, Palladium, compds. 7440-06-4D, Platinum, compds.
 7440-15-5D, Rhenium, compds. 7440-16-6D, Rhodium, compds.
 7440-18-8D, Ruthenium, compds. 7440-22-4D, Silver, compds.
 7440-33-7D, Tungsten, compds. 7440-53-1D, Europium, compds.
 7440-57-5D, Gold, compds. 94928-86-6, Tris(2-phenylpyridine)iridium
 435293-93-9

(devices with hole-blocking materials incorporating double bonded structural units)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1998	1998		PATENT ABSTRACTS OF	
Konica Corporation	2003			EP 1353388 A	HCAPLUS
Oki Electric Ind Co Ltd	1998			JP 10231479 A	HCAPLUS
Salbeck, J	1997	91	209	SYNTHETIC METALS	HCAPLUS
Sato, H	2002			US 2002125818 A1	
Spreitzer, H	2000	4105	125	PROCEEDINGS OF THE S	
Tokito, S	2000	363	290	THIN SOLID FILMS	
Watanabe, T	2002			US 2002015859 A1	HCAPLUS

L62 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:493816 HCAPLUS Full-text

DOCUMENT NUMBER: 143:34908

TITLE: Organic electroluminescent element hole-
 blocking layers with six-membered ring
 unit-containing compounds and spirobifluorene
 derivatives and electronic devices using them

INVENTOR(S): Vestweber, Horst; Gerhard, Anja
 ; Stoessel, Philipp

PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H.,
 Germany

SOURCE: PCT Int. Appl., 38 pp.
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053055	A1	20050609	WO 2004-EP13314	20041124
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL,			

PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN,
 GQ, GW, ML, MR, NE, SN, TD, TG

DE 10356099	A1	20050707	DE 2003-10356099	20031127
EP 1687857	A1	20060809	EP 2004-803245	20041124
EP 1687857	B1	20090909		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,
 PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS

CN 1954446	A	20070425	CN 2004-80035289	20041124
JP 2007520875	T	20070726	JP 2006-540365	20041124
AT 442675	T	20090915	AT 2004-803245	20041124
US 20070051944	A1	20070308	US 2006-580491	20060523
KR 2006122874	A	20061130	KR 2006-710343	20060526

PRIORITY APPLN. INFO.: DE 2003-10356099 A 20031127

WO 2004-EP13314 W 20041124

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

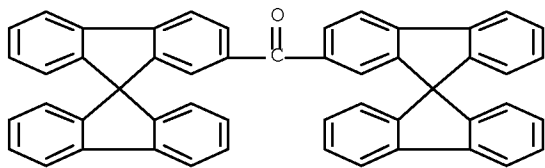
OTHER SOURCE(S): MARPAT 143:34908

AB Organic ~~electroluminescent~~ devices comprising an anode, a cathode, and ≥ 1 emitting layer, which consists of a matrix material which is doped with ≥ 1 phosphorescent emitter, are described which employ compds. including units based on six-membered rings formed from C and/or N atoms, especially triazines, pyrimidines, pyridazines, and pyrazines, as materials for a hole-blocking layer between the emitting layer and the cathode. Compds., which may be employed in the devices, are described which comprise spirobifluorene derivs. with ≥ 1 triazine unit bonded to them, optionally along with other six-membered ring-containing substituents. The use of the design of the ~~electroluminescent~~ devices in other electronic devices, including organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors, is also described. Organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors.

IT 782504-07-8
 (organic ~~electroluminescent~~ element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

RN 782504-07-8 HCAPLUS

CN Methanone, bis(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



IPCI H01L0051-30 [ICM,7]; H01L0051-05 [ICM,7,C*]; C07D0251-24 [ICS,7];
 C07D0251-00 [ICS,7,C*]; C07D0253-06 [ICS,7]; C07D0253-00 [ICS,7,C*];
 C07D0239-26 [ICS,7]; C07D0239-00 [ICS,7,C*]
 IPCR C07D0239-00 [I,C*]; C07D0239-26 [I,A]; C07D0251-00 [I,C*]; C07D0251-24
 [I,A]; C07D0253-00 [I,C*]; C07D0253-065 [I,A]; H01L0051-05 [I,C*];
 H01L0051-30 [I,A]
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)

Section cross-reference(s): 25, 27, 28, 74, 76

- ST spirobifluorene deriv hole blocking layer electronic device;
transistor six membered ring deriv hole blocking layer;
integrated circuit six membered ring deriv hole blocking
layer; solar cell six membered ring deriv hole blocking
layer; laser diode six membered ring deriv hole blocking
layer; photoreceptor six membered ring deriv hole blocking
layer; six membered ring deriv hole blocking layer
electronic device; triazine deriv hole blocking layer org
electroluminescent device; pyrimidine deriv hole
blocking layer org electroluminescent device;
pyrazine deriv hole blocking layer org
electroluminescent device; pyridazine deriv hole
blocking layer org electroluminescent device
- IT Imines
Ketones, uses
Phosphazenes
Phosphines
Sulfones
Sulfoxides
(emitting layer matrix; organic electroluminescent element
with hole-blocking layers formed from compds. including
six-membered rings and spirobifluorene derivs. and electronic
devices using them)
- IT Spiro compounds
(organic electroluminescent element with hole-
blocking layers formed from compds. including six-membered
rings and spirobifluorene derivs. and electronic devices using
them)
- IT Electroluminescent devices
Electrophotographic photoconductors (photoreceptors)
Integrated circuits
Semiconductor lasers
Solar cells
Transistors
(organic; organic electroluminescent element with hole-
blocking layers formed from compds. including six-membered
rings and spirobifluorene derivs. and electronic devices using
them)
- IT 7439-98-7D, Molybdenum, derivs. 7440-04-2D, Osmium, derivs.
7440-05-3D, Palladium, derivs. 7440-06-4D, Platinum, derivs.
7440-15-5D, Rhenium, derivs. 7440-16-6D, Rhodium, derivs.
7440-18-8D, Ruthenium, derivs. 7440-22-4D, Silver, derivs.
7440-33-7D, Tungsten, derivs. 7440-53-1D, Europium, derivs.
7440-57-5D, Gold, derivs.
(emitting layer dopant; organic electroluminescent element
with hole-blocking layers formed from compds. including
six-membered rings and spirobifluorene derivs. and electronic
devices using them)
- IT 289-80-5D, Pyridazine, derivs. 289-95-2D, Pyrimidine, derivs.
290-37-9D, Pyrazine, derivs. 782504-07-8
(organic electroluminescent element with hole-
blocking layers formed from compds. including six-membered
rings and spirobifluorene derivs. and electronic devices using
them)
- IT 94928-86-6, Tris(2-phenylpyridine)iridium
(organic electroluminescent element with hole-
blocking layers formed from compds. including six-membered
rings and spirobifluorene derivs. and electronic devices using
them)

IT 853154-59-3P 853154-60-6P 853154-61-7P
 (organic electroluminescent element with hole-
 blocking layers formed from compds. including six-membered
 rings and spirobifluorene derivs. and electronic devices using
 them)

IT 3842-55-5, 2-Chloro-4,6-diphenyl-1,3,5-triazine 34177-11-2,
 3-Chloro-5,6-diphenyl-1,2,4-triazine 463944-32-3 853154-62-8
 (organic electroluminescent element with hole-
 blocking layers formed from compds. including six-membered
 rings and spirobifluorene derivs. and electronic devices using
 them)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2003	2003		PATENT ABSTRACTS OF	
Fink, R	2002			US 6352791 B1	HCAPLUS
Hayoz, P	2004			WO 2004077885 A	HCAPLUS
Hoechst Ag	1996			DE 4446818 A1	HCAPLUS
Hu, N	2001			US 6229012 B1	HCAPLUS
Jean-Hugues, F	2004	69	1762	JOURNAL OF ORGANIC C	
Nishi, T	2002			US 2002034659 A1	HCAPLUS
Toray Ind Inc	2003			JP 2003086381 A	HCAPLUS
Wu, C	2002	81	577	APPLIED PHYSICS LETT	HCAPLUS
Xerox Corporation	2004			EP 1385221 A	HCAPLUS
OS.CITING REF COUNT:	4	THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (9 CITINGS)			

=> D L64 1-10 IBIB ABS HITSTR HITIND RETABLE

L64 ANSWER 1 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2005:1106699 HCAPLUS Full-text
 DOCUMENT NUMBER: 143:376222
 TITLE: Organic light emitting diode

containing a novel Ir complex as a
 phosphorescent emitter

INVENTOR(S): Cheng, Chien-Hong; Duan, Jiun-Pey; Rayabarapu,
 Dinesh Kumar; Jennifer, Betty Marie

PATENT ASSIGNEE(S): Cheng, Chien-Hong, Taiwan

SOURCE: U.S. Pat. Appl. Publ., 25 pp.
 CODEN: USXXCO

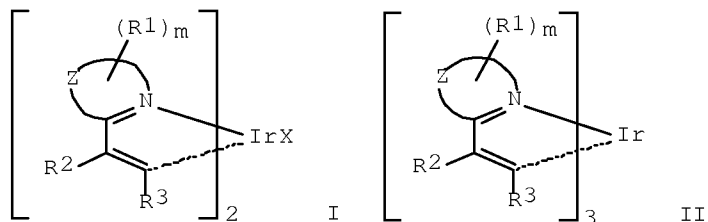
DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050227109	A1	20051013	US 2004-822647	20040413
			<--	
US 7320834	B2	20080122		
TW 232704	B	20050511	TW 2003-92120288	20030724
			<--	
KR 2005012132	A	20050131	KR 2004-55376	20040716
			<--	
KR 853701	B1	20080825		
PRIORITY APPLN. INFO.:			TW 2003-92120288	A 20030724
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S):
GI

MARPAT 143:376222

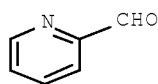


AB Organic light-emitting diodes are described which employ an electroluminescent medium which comprises a phosphorescent Ir complex described by general formula I or II (X = a monoanionic bidentate ligand; Z = an atomic moiety capable of forming a nitrogen-containing heterocyclic group; R1 = H, halo, C1-6 alkyl, halogen-substituted C1-6 alkyl, C1-6 alkoxy, Ph-C1-6 alkyl, amino, and aryl; m = 0 or any pos. integer determined by the ring size of the nitrogen-containing heterocyclic group; R2 and R3 = independently selected H, halogen, C1-6 alkyl, halogen-substituted C1-6 alkyl, C1-6 alkoxy, Ph C1-6 alkyl, amino, aryl, and heterocyclic aryl).

IT 1121-60-4, 2-Pyridinecarboxaldehyde 1122-62-9
10025-87-3, Phosphoryl chloride
(organic light-emitting diodes employing iridium complexes as phosphorescent emitters)

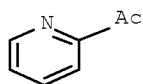
RN 1121-60-4 HCAPLUS

CN 2-Pyridinecarboxaldehyde (CA INDEX NAME)



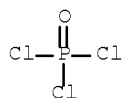
RN 1122-62-9 HCAPLUS

CN Ethanone, 1-(2-pyridinyl)- (CA INDEX NAME)



RN 10025-87-3 HCAPLUS

CN Phosphoric trichloride (CA INDEX NAME)



INCL 428690000; X42-891.7; X31-350.4; X31-350.6; X25-710.2
 IPCI H01L0051-54 [I,A]; H01L0051-50 [I,C*]; C09K0011-06 [N,A]
 IPCR H05B0033-14 [I,C*]; H05B0033-14 [I,A]; H01L0051-50 [I,C]; H01L0051-50 [I,A]; H01L0051-54 [I,A]; C09K0011-06 [I,C*]; C09K0011-06 [I,A]; H05B0033-12 [I,C*]; H05B0033-20 [I,A]; H05B0033-22 [I,C*]; H05B0033-22 [I,A]
 NCL 428/690.000; 257/102.000; 313/504.000; 313/506.000; 428/917.000; 257/E51.044
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 76, 78
 ST org light emitting diode iridium complex
 phosphorescent emitter
 IT Phosphorescent substances
 (organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT Electroluminescent devices
 (organic; organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 123847-85-8, NPB 192198-85-9, TPBI
 (electron-transporting material; organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 185690-41-9, 4,4',4''-Tris(2-naphthylphenylamino)triphenylamine
 (hole injection modification layer containing; organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 4733-39-5, BCP 146162-54-1, BAlq
 (hole-blocking layer containing; organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 19287-68-4 58328-31-7
 (hole-transporting material; organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 844818-66-2P 844818-67-3P 844818-68-4P 844818-69-5P
 844818-70-8P 844818-71-9P 844818-72-0P 844818-73-1P
 844818-74-2P 844818-75-3P
 (organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 75-03-6, Ethyl iodide 100-39-0 109-04-6, 2-Bromopyridine
 536-74-3, Phenylacetylene 603-35-0, Triphenylphosphine, reactions
 612-62-4 615-20-3 634-47-9 688-73-3, Tributyltin hydride
 1121-60-4, 2-Pyridinecarboxaldehyde 1122-62-9
 1532-72-5, Isoquinoline N-oxide 3510-66-5 10025-83-9, Iridium trichloride 10025-87-3, Phosphoryl chloride 15727-65-8
 52248-74-5 52334-81-3 59066-57-8,
 1-((E)-2-Phenyl-1-ethenyl)isoquinoline
 (organic light-emitting diodes employing iridium complexes as phosphorescent emitters)
 IT 538-49-8P 4736-60-1P, Triphenylethylphosphonium iodide 7370-19-6P

13673-46-6P 19493-44-8P, 1-Chloroisoquinoline 38101-69-8P,
 2-((E)-2-Phenyl-1-ethenyl)quinoline 53500-07-5P 59066-61-4P
 66680-88-4P 84586-45-8P, 4-Methyl-2-((E)-2-phenyl-1-
 ethenyl)quinoline 844698-46-0P
 (organic light-emitting diodes employing iridium
 complexes as phosphorescent emitters)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Deaton	2005			US 20050123792 A1	HCAPLUS
Deaton	2005			US 20050123798 A1	HCAPLUS
Hamada	2003			US 20030194580 A1	HCAPLUS
Hamada	2006			US 7022422 B2	HCAPLUS
Lussier	2005			US 20050123795 A1	HCAPLUS
Sano	1995			US 5432014 A	HCAPLUS
Sato	2002			US 20020125818 A1	HCAPLUS
Takiguchi	2002			US 20020100906 A1	HCAPLUS
Takiguchi	2004			US 6797980 B2	HCAPLUS
Thompson	2002			US 20020034656 A1	HCAPLUS

L64 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:275804 HCAPLUS Full-text

DOCUMENT NUMBER: 142:363426

TITLE: Organic electroluminescent devices with
 high luminance, durability, and emission
 efficiency and materials therefor

INVENTOR(S): Onikubo, Shunichi; Enokida, Toshio; Suda,
 Yasumasa; Toba, Yasumasa; Kimura, Yasunori;
 Kaneko, Tetsuya

PATENT ASSIGNEE(S): Toyo Ink Mfg. Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 35 pp.

CODEN: JKXXAF

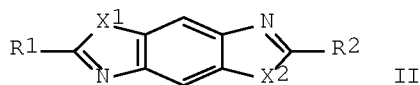
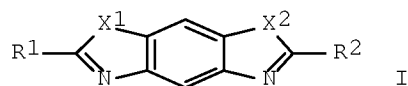
DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005082703	A	20050331	JP 2003-316325	20030909
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JP 4306379	B2	20090729		
PRIORITY APPLN. INFO.:			JP 2003-316325	20030909
			<--	
OTHER SOURCE(S):		MARPAT 142:363426		
GI				

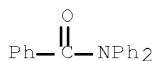


AB The materials contain (A) heterocyclic compds. wherein plural N-containing rings are fused directly or via other carbon or heterocyclic rings and (B) phosphorescent substances (e.g., organic compds., Ir or Pt complexes with organic ligands). The compds. A may be I or II [X1, X2 = O, S, NR3; R1-R3 = (cyclo)alkyl, aryl, heterocyclic]. In organic EL devices having emitting layers or those-including plural organic layers between a pair of electrodes, ≥ 1 of the layers contain the above materials. The devices may have electron-injecting layers between cathodes and the emitting layers, hole-blocking layers between the electron-injecting layers and the emitting layers, and/or hole-injecting layers between anodes and the emitting layers.

IT 4051-56-3 31671-77-9, Anthraldehyde
(in preparation of phosphors; phosphors containing benzobisthiazole-like fused heterocyclic compds. for durable organic EL devices with high emission efficiency)

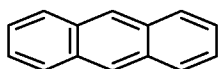
RN 4051-56-3 HCAPLUS

CN Benzamide, N,N-diphenyl- (CA INDEX NAME)



RN 31671-77-9 HCAPLUS

CN Anthracenecarboxaldehyde (CA INDEX NAME)



D1-CHO

IPCI C09K0011-06 [I,A]; H01L0051-50 [I,A]

IPCR C09K0011-06 [I,A]; C09K0011-06 [I,C*]; H05B0033-14 [I,A]; H05B0033-14 [I,C*]; H01L0051-50 [I,C*]; H01L0051-50 [I,A]

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST org electroluminescent emission efficiency durability
luminance; EL phosphor benzobisthiazole benzobisoxazole

benzobisimidazole; phosphorescent iridium platinum complex
doped EL phosphor

IT Electroluminescent devices

(organic; phosphors containing benzobisthiazole-like fused heterocyclic
comps. for durable organic EL devices with high emission
efficiency)

IT Phosphors

(phosphors containing benzobisthiazole-like fused heterocyclic comps.
for durable organic EL devices with high emission
efficiency)

IT 14187-14-5 31248-39-2 94928-86-6 149005-33-4 343978-94-9
376367-93-0 848902-76-1

(dopants, emitting layers; phosphors containing benzobisthiazole-like
fused heterocyclic comps. for durable organic EL devices
with high emission efficiency)

IT 2085-33-8 395644-78-7

(electron-injecting layers; phosphors containing benzobisthiazole-like
fused heterocyclic comps. for durable organic EL devices
with high emission efficiency)

IT 65181-78-4

(emitting layers, hole-injecting layers; phosphors containing
benzobisthiazole-like fused heterocyclic comps. for durable organic
EL devices with high emission efficiency)

IT 905-62-4, 2,5-Bis(1-naphthyl)-1,3,4-oxadiazole

(emitting layers; phosphors containing benzobisthiazole-like fused
heterocyclic comps. for durable organic EL devices with
high emission efficiency)

IT 219596-73-3P 219596-76-6P 219597-18-9P

(emitting layers; phosphors containing benzobisthiazole-like fused
heterocyclic comps. for durable organic EL devices with
high emission efficiency)

IT 13399-13-8 133531-74-5 219596-84-6 219596-97-1 219597-01-0
219597-22-5 219597-29-2 219597-32-7 219597-58-7 848941-49-1
848941-50-4 848941-51-5 848941-52-6 848941-53-7 848941-54-8

(emitting layers; phosphors containing benzobisthiazole-like fused
heterocyclic comps. for durable organic EL devices with
high emission efficiency)

IT 1662-01-7, Bathophenanthroline 4733-39-5, Bathocuproin 146162-49-4
150405-69-9, 3-(4-Biphenyl)-4-phenyl-5-(4-tert-butylphenyl)-1,2,4-
triazole 188049-37-8 221554-51-4 848902-77-2 848902-78-3

(hole-blocking layers; phosphors containing
benzobisthiazole-like fused heterocyclic comps. for durable organic
EL devices with high emission efficiency)

IT 147-14-8, Copper phthalocyanine 123847-85-8 182507-83-1

185690-39-5, 4,4',4''-Tris[N-(1-naphthyl)-N-phenylamino]triphenylamine
(hole-injecting layers; phosphors containing benzobisthiazole-like
fused heterocyclic comps. for durable organic EL devices
with high emission efficiency)

IT 4051-56-3 16523-31-2 31671-77-9, Anthraldehyde
848941-55-9

(in preparation of phosphors; phosphors containing benzobisthiazole-like
fused heterocyclic comps. for durable organic EL devices
with high emission efficiency)

L64 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:275803 HCAPLUS Full-text

DOCUMENT NUMBER: 142:363425

TITLE: Organic electroluminescent devices with
high luminance, durability, and emission
efficiency and materials therefor

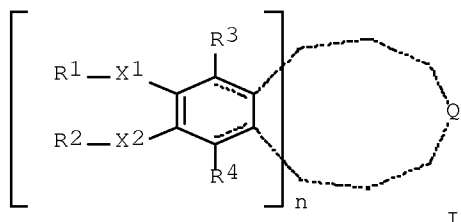
August 16, 2010

10/581,005

30

INVENTOR(S): Onikubo, Shunichi; Enokida, Toshio; Suda, Yasumasa; Toba, Yasumasa; Kimura, Yasunori; Kaneko, Tetsuya
 PATENT ASSIGNEE(S): Toyo Ink Mfg. Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 54 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005082702	A	20050331	JP 2003-316324	20030909
			<--	
PRIORITY APPLN. INFO.:			JP 2003-316324	20030909
			<--	
OTHER SOURCE(S):	MARPAT 142:363425			
GI				

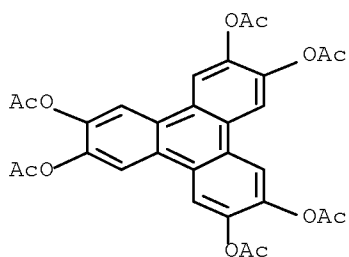


AB The materials contain compds. having I units [X1, X2 = O, CO2, OCO; R1, R2 = (cyclo)alkyl, aryl, heterocyclic; R3, R4 = H, halo, CN, NO2, alkyl(oxy), aryl(oxy), alkylthio, arylthio, amino, acyl, heterocyclic; Q = fused ring structure or linking group forming rings with the units; n = 2-6] and phosphorescent substances (e.g., organic compds., Ir or Pt complexes with organic ligands). In organic EL devices having emitting layers (A) or A- including plural organic layers between a pair of electrodes, ≥1 of the layers contain the above materials. The devices may have hole-injecting layers (B) between anodes and A, electron-blocking layers between A and B, electron-injecting layers (C) between cathodes and A, and/or hole- blocking layers between C and A.

IT 32829-08-6 848940-24-9
 (emitting layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

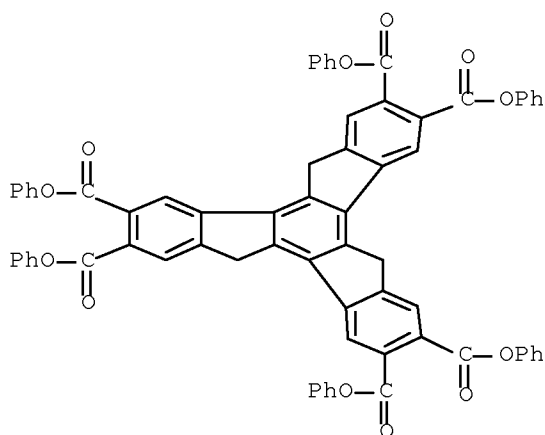
RN 32829-08-6 HCAPLUS

CN 2,3,6,7,10,11-Triphenylenehexol, 2,3,6,7,10,11-hexaacetate (CA INDEX NAME)



RN 848940-24-9 HCAPLUS

CN 5H-Tribenzo[a,f,k]trindene-2,3,7,8,12,13-hexacarboxylic acid,
10,15-dihydro-, 2,3,7,8,12,13-hexaphenyl ester (CA INDEX NAME)



IPCI C09K0011-06 [ICM,7]; H05B0033-14 [ICS,7]; H05B0033-22 [ICS,7]

IPCR C09K0011-06 [I,A]; C09K0011-06 [I,C*]; H05B0033-14 [I,A]; H05B0033-14 [I,C*]; H05B0033-22 [I,A]; H05B0033-22 [I,C*]

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST org ~~electroluminescent~~ emission efficiency durability
luminance; fused alkoxybenzene acyloxybenzene benzenecarboxylic acid
EL phosphor; alkoxytriphenylene phosphor iridium platinum
complex doped EL

IT Phosphors
(fused aromatic compound-containing phosphors for organic EL devices
with high luminance, durability, and emission efficiency)

IT Electroluminescent devices
(organic; fused aromatic compound-containing phosphors for organic EL
devices with high luminance, durability, and emission efficiency)

IT 14187-14-5 31248-39-2 94928-86-6 149005-33-4 344796-24-3
376367-93-0 848902-76-1
(dopants, emitting layers; fused aromatic compound-containing phosphors for
organic EL devices with high luminance, durability, and
emission efficiency)

IT 208939-07-5 848940-26-1
(electron-blocking layers; fused aromatic compound-containing

phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 2085-33-8 23467-27-8 395644-78-7
(electron-injecting layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 905-62-4, 2,5-Bis(1-naphthyl)1,3,4-oxadiazole 58328-31-7, CBP 65181-78-4 192198-85-9
(emitting layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 23417-07-4 ~~32829-08-6~~ 32829-11-1 134025-08-4
134025-15-3 134656-41-0 162281-25-6 208938-92-5 208939-01-9
208939-08-6 208939-12-2 208939-44-0 848940-19-2 848940-20-5
848940-22-7 848940-23-8 ~~848940-24-9~~ 848940-25-0
848940-28-3
(emitting layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 808-57-1P
(fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 1662-01-7, Bathophenanthroline 4733-39-5, Bathocuproin 146162-49-4
146162-54-1 150405-69-9, 3-(4-Biphenyl)-4-phenyl-5-(4-tert-butylphenyl)-1,2,4-triazole 221554-51-4 848902-77-2 848902-78-3
(hole-blocking layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 208939-55-3 848940-21-6 848940-27-2
(hole-injecting and electron-blocking layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 147-14-8, Copper phthalocyanine 123847-85-8 182507-83-1
185690-39-5, 4,4',4''-Tris[N-(1-naphthyl)-N-phenylamino]triphenylamine
(hole-injecting layers; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

IT 91-16-7, 1,2-Dimethoxybenzene
(in preparation of phosphors; fused aromatic compound-containing phosphors for organic EL devices with high luminance, durability, and emission efficiency)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L64 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2005:78038 HCAPLUS Full-text
DOCUMENT NUMBER: 142:186236
TITLE: Materials and structures for enhancing the performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection
INVENTOR(S): Thompson, Mark E.; Kwong, Raymond; Tung, Yeh-Jiun
PATENT ASSIGNEE(S): The University of Southern California, USA; Universal Display Corporation
SOURCE: U.S. Pat. Appl. Publ., 16 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent

August 16, 2010

10/581,005

33

LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050019604	A1	20050127	US 2003-626579	20030725
			<--	
US 7018723	B2	20060328		
US 20050025993	A1	20050203	US 2004-785287	20040223
			<--	
WO 2005013388	A2	20050210	WO 2004-US23349	20040721
			<--	
WO 2005013388	A3	20050428		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 20080309222	A1	20081218	US 2007-974020	20071010
			<--	
PRIORITY APPLN. INFO.:			US 2003-626579	A2 20030725
			<--	
			US 2004-785287	A 20040223

OTHER SOURCE(S): MARPAT 142:186236

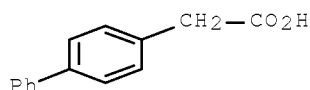
AB Electroluminescent devices are described which comprise an anode; a cathode; a first organic layer disposed between the anode and the cathode, where the first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode; and a second organic layer disposed between the first organic layer and the cathode, where the second organic layer is in direct contact with the first organic layer, and where the second organic layer comprises an aromatic hydrocarbon material.

IT 5728-52-9, 4-Biphenylacetic acid

(aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection prepared using)

RN 5728-52-9 HCAPLUS

CN [1,1'-Biphenyl]-4-acetic acid (CA INDEX NAME)



INCL 428690000; X42-891.7; X42-821.2; X31-350.4; X31-350.6

IPCI H05B0033-12 [I,A]

IPCR C07C0013-00 [I,C*]; C07C0013-567 [I,A]; C07C0013-66 [I,A]; C07C0015-00 [I,C*]; C07C0015-24 [I,A]; C07C0015-38 [I,A]; C09K0011-06 [I,C*]; C09K0011-06 [I,A]; H01L0051-00 [N,C*]; H01L0051-00 [N,A]; H01L0051-05 [I,C*]; H01L0051-30 [I,A]; H01L0051-50 [I,C*]; H01L0051-50 [I,A];

H05B0033-14 [I,C*]; H05B0033-14 [I,A]; H05B0033-12 [I,A]; H05B0033-12 [I,C]
 NCL 428/690.000; 313/504.000; 313/506.000; 428/212.000; 428/917.000
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 22, 25, 76
 ST org emitting device arom hydrocarbon hole blocking electron injection
 IT Electroluminescent devices
 (materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)
 IT 94928-86-6, Tris(2-phenylpyridine)iridium
 (CBP doped with; materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)
 IT 448-61-3, 2,4,6-Triphenylpyrylium tetrafluoroborate 1310-73-2, Sodium hydroxide, reactions 5728-52-9, 4-Biphenylacetic acid
 (aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection prepared using)
 IT 58328-31-7
 (doped emissive layer; materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)
 IT 751-38-2D, derivs. 2085-33-8, Alq3 97388-42-6D, derivs.
 (electron-transporting layer; materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)
 IT 97388-42-6P
 (electron-transporting layer; materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)
 IT 751-38-2
 (materials and structures for enhancing performance of organic light emitting devices and use of aromatic hydrocarbon material as enhancement layer for hole blocking and superior electron injection)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Adachi	2001	90	5048	J. Appl. Phys.	HCAPLUS
Adachi, C	2000	77	904	Applied Physics Lett	HCAPLUS
Anon	1999			WO 9965961	HCAPLUS
Anon	2002			WO 02052661 A1	
Anon	2002			WO 02074015	HCAPLUS
Anon	2003			WO 03007658	HCAPLUS
Bacher		3148	313	SPIE	HCAPLUS
Baldo	1999	75	4	Appl. Phys. Lett.	
Baldo	1998	395	151	Nature	HCAPLUS
Bulovic	1998			US 5834893 A	HCAPLUS
Forrest	1997			US 5703436 A	HCAPLUS
Forrest	1998			US 5707745 A	HCAPLUS
Forrest	2000			US 6091195 A	HCAPLUS

Forrest	2002			US 6337102 B1	HCAPLUS
Friend	1993			US 5247190 A	
Gu	1998			US 5844363 A	HCAPLUS
Igarashi	2003			US 20030039858 A1	HCAPLUS
Ishiskawa	2002			US 6492041 B1	HCAPLUS
Kenji Okumoto	2003	15	699	Chem. Mater.	
Kim	2001			US 6294398 B1	
Kim	2002			US 6468819 B1	HCAPLUS
Kinoshita, M	2002	10	780	Adv. Funct. Mater.	
Kwong, R	2002	81	162	Applied Physics Lett	HCAPLUS
Lee, C	2000	77	2280	Applied Physics Lett	HCAPLUS
Sakon	1991			US 5077142 A	HCAPLUS
Stossel	2004			US 20040058194 A1	HCAPLUS
Sturm	2000			US 6087196 A	HCAPLUS
Suzuki	2004			US 6830829 B1	HCAPLUS
Tamano	2000			US 6150042 A	HCAPLUS
Tamano	2001			US 6245449 B1	HCAPLUS
Thompson	2000			US 6013982 A	HCAPLUS
Thompson	2001			US 6303238 B1	HCAPLUS
Thompson	2003			US 20030068528 A1	HCAPLUS
Thompson	2004			US 20040155238 A1	HCAPLUS
Vadim Adamovich	2002			MRS Spring Meeting	
Vadim Adamovich	2003	4	77	Organic Electronics	
Wang, Y	2001	79	449	Applied Physics Lett	HCAPLUS
Xie	1999			US 5989737 A	HCAPLUS

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

L64 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:609639 HCAPLUS Full-text

DOCUMENT NUMBER: 141:147906

TITLE: Organic light emitting diode
device with organic hole transporting material and
phosphorescent material

INVENTOR(S): Lee, Yung-Chih; Chen, Wei-Su; Liao, Chi-Chih; Lee,
Jiun-Haw

PATENT ASSIGNEE(S): Ritdisplay Corp., Taiwan

SOURCE: U.S. Pat. Appl. Publ., 7 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20040144974	A1	20040729	US 2003-248553	20030129

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US 6822257	B2	20041123
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PRIORITY APPLN. INFO.:	US 2003-248553	20030129
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An organic light emitting diode (OLED) device that comprises a substrate, an anode layer, a light-emitting layer, a hole blocking layer and a cathode layer. The anode layer is positioned over the substrate and the light-emitting layer is positioned over the anode layer. The hole blocking layer is positioned over the light-emitting layer and the cathode layer is positioned over the hole blocking layer. The light-emitting layer is an organic material layer consisted of hole transporting material and phosphorescent material and that the concentration of hole transporting material and

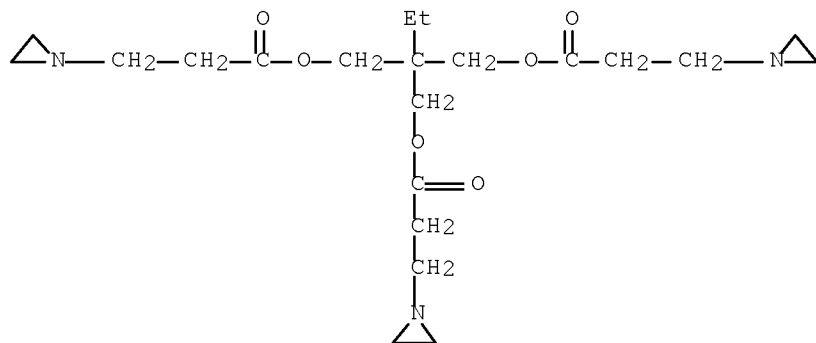
phosphorescent material in the organic material layer is between 40% to 60% by weight

IT 52234-82-9, TAZ

(organic light emitting diode device with organic hole transporting material and phosphorescent material)

RN 52234-82-9 HCAPLUS

CN 1-Aziridinepropanoic acid, 1,1'-[2-[[3-(1-aziridiny1)-1-oxopropoxy]methyl]-2-ethyl-1,3-propanediyl] ester (CA INDEX NAME)



INCL 257040000; 257082000; 257184000

IPCI H01L0035-24 [ICM,7]; H01L0035-12 [ICM,7,C*]; H01L0051-00 [ICS,7]; H01L0027-15 [ICS,7]; H01L0031-12 [ICS,7]

IPCR H01L0051-05 [N,C*]; H01L0051-30 [N,A]; H01L0051-50 [I,C*]; H01L0051-50 [I,A]; H01L0051-00 [N,C*]; H01L0051-00 [N,A]

NCL 257/040.000; 257/082.000; 257/184.000; 257/079.000; 257/098.000; 257/099.000; 257/102.000; 257/103.000

CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

ST org light emitting diode device hole transporting phosphorescent material; OLED hole transporting phosphorescent material

IT Electroluminescent devices

Hole (electron)

Phosphorescent substances

Phosphors

(organic light emitting diode device with organic hole transporting material and phosphorescent material)

IT 119-65-3D, Isoquinoline, iridium complexes 147-14-8, Copper phthalocyanine 841-73-6, BCP 2085-33-8 7429-90-5, Aluminum, uses 7439-88-5D, Iridium, isoquinoline complexes 7440-70-2, Calcium, uses 15082-28-7, PBD 37271-44-6 37275-76-6, Aluminum zinc oxide 50926-11-9, Indium tin oxide 52234-82-9, TAZ 65181-78-4, TPD 117944-65-7, Indium zinc oxide 123847-85-8, NPB 124729-98-2, m-MTDATA 146162-54-1, Balq 148896-39-3 192198-85-9, TPBI

(organic light emitting diode device with organic hole transporting material and phosphorescent material)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Adachi	2002			US 20020180347 A1	HCAPLUS
Adachi	2003			US 6573651 B2	HCAPLUS

Baldo	2000		US 6097147 A	HCAPLUS
Bellmann	2003		US 20030068525 A1	HCAPLUS
Hsieh	2003		US 20030162299 A1	HCAPLUS
Kwong	2002		US 20020074935 A1	HCAPLUS
Li	2003		US 20030138657 A1	HCAPLUS
Mishima	2002		US 20020096995 A1	HCAPLUS
Mori	2004		US 20040028944 A1	HCAPLUS
Sato	2003		US 20030218418 A9	HCAPLUS

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L64 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:119647 HCAPLUS Full-text

DOCUMENT NUMBER: 140:189702

TITLE: Polynuclear metal complexes as
phosphorescence emitters in
electroluminescent layer arrangements

INVENTOR(S): Heuer, Helmut-Werner; Wehrmann, Rolf; Sautter,
Armin

PATENT ASSIGNEE(S): Germany

SOURCE: U.S. Pat. Appl. Publ., 30 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 20040026663	A1	20040212	US 2003-635842	20030806
			<--	
EP 1394171	A1	20040303	EP 2003-17031	20030728
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CA 2436658	A1	20040209	CA 2003-2436658	20030806
			<--	
JP 2004075681	A	20040311	JP 2003-206477	20030807
			<--	
KR 2004014346	A	20040214	KR 2003-54907	20030808
			<--	
PRIORITY APPLN. INFO.:			DE 2002-10236538	A 20020809
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 140:189702

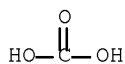
AB Polynuclear metal complexes of the general formula (LmMe-HL)n-XL, a process for their preparation and their use as phosphorescence emitters in electroluminescent layer arrangements are described, where Me is a transition metal, L is a bidentate chelate-forming ligand, HL is a bidentate chelate-forming ligand which complexes the transition metal Me and is addnl. bonded to a linker XL, XL is an n-functional linker and is covalently bonded to n auxiliary ligands HL, n is an integer from 2 to 6 and m is an integer from 1 to 3.

IT 497-19-8, Sodium carbonate (Na2CO3), uses 584-08-7
, Potassium carbonate (K2CO3)

(base, polynuclear metal complex prepared using; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)

RN 497-19-8 HCAPLUS

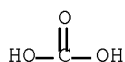
CN Carbonic acid sodium salt (1:2) (CA INDEX NAME)



●2 Na

RN 584-08-7 HCAPLUS

CN Carbonic acid, potassium salt (1:2) (CA INDEX NAME)

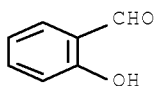


●2 K

IT 90-02-8, 2-Hydroxybenzaldehyde, reactions
(polynuclear metal complexes, their preparation and use as
phosphorescence emitters in electroluminescent
layer arrangements)

RN 90-02-8 HCAPLUS

CN Benzaldehyde, 2-hydroxy- (CA INDEX NAME)



INCL 252301160; 428690000; 556018000

IPCI C09K0011-06 [ICM, 7]; C07F0001-00 [ICS, 7]

IPCR H05B0033-10 [I, C*]; H05B0033-10 [I, A]; C07B0061-00 [I, C*]; C07B0061-00 [I, A]; C07C0249-00 [I, C*]; C07C0249-02 [I, A]; C07C0251-00 [I, C*]; C07C0251-24 [I, A]; C07D0213-00 [I, C*]; C07D0213-16 [I, A]; C07D0213-26 [I, A]; C07D0409-00 [I, C*]; C07D0409-04 [I, A]; C07F0005-00 [I, C*]; C07F0005-00 [I, A]; C07F0015-00 [I, C*]; C07F0015-00 [I, A]; C09K0011-06 [I, C*]; C09K0011-06 [I, A]; H01L0051-00 [I, C*]; H01L0051-00 [I, A]; H01L0051-05 [I, C*]; H01L0051-30 [I, A]; H01L0051-50 [I, C*]; H01L0051-50 [I, A]

NCL 252/301.160; 428/690.000; 556/018.000

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76, 78

ST polynuclear metal complex phosphorescence
electroluminescent device

IT Amines, uses

(aromatic, hole-conducting layer; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)

- IT Amines, uses
(aryl, tertiary, polynuclear metal complex-doped; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Luminescent substances
(electroluminescent; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Polymers, uses
(polynuclear metal complex-doped; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Electroluminescent devices
Phosphorescent substances
(polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Transition metal complexes
(polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Coordination compounds
(polynuclear; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT Conducting polymers
(polythiophenes, cationic, hole-injecting layer; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 124-41-4, Sodium methanolate 497-19-3, Sodium carbonate (Na₂CO₃), uses 584-03-7, Potassium carbonate (K₂CO₃)
(base, polynuclear metal complex prepared using; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 4733-39-5, 2,9-Dimethyl-4,7-diphenyl[1,10]phenanthroline 34777-53-2
150405-69-9, TAZ 399038-18-7
(hole-blocking layer; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 188049-41-4
(hole-blocking or electron-transport layer; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 15082-28-7, 2-(4-Biphenyl)-5-(4-tert-butylphenyl)-1,3,4-oxadiazole
25067-59-8, Poly-N-vinylcarbazole 25190-62-9, Poly(1,4-phenylene)
58328-31-7 99627-56-2, Poly(9H-fluorene-2,7-diyl)
(polynuclear metal complex-doped; polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 7439-88-5DP, Iridium, compds. 7440-06-4DP, Platinum, compds.
(polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 67360-21-8P 116563-50-9P 658042-18-3P
(polynuclear metal complexes, their preparation and use as phosphorescence emitters in electroluminescent layer arrangements)
- IT 4434-23-5P 17911-94-3P 20425-75-6P 658042-16-1P 658042-17-2P
658043-91-5P 658043-92-6P 658043-93-7P 658043-94-8P
658043-95-9P

(polynuclear metal complexes, their preparation and use as
phosphorescence emitters in electroluminescent
layer arrangements)

IT 90-02-8, 2-Hydroxybenzaldehyde, reactions 101-77-9
108-45-2, m-Phenylenediamine, reactions 646-25-3, 1,10-Decanediamine
2479-47-2 2783-17-7, 1,12-Diaminododecane 3377-24-0 4097-89-6
85642-05-3 118727-34-7, 1,3,5-Tris(4-aminophenyl)benzene
343978-72-3 417705-49-8

(polynuclear metal complexes, their preparation and use as
phosphorescence emitters in electroluminescent
layer arrangements)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

L64 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2003:817598 HCAPLUS Full-text

DOCUMENT NUMBER: 139:314295

TITLE: Organic electroluminescence element

INVENTOR(S): Oshiyama, Tomohiro; Kita, Hiroshi; Yamada,
Taketoshi

PATENT ASSIGNEE(S): Konica Corporation, Japan

SOURCE: Eur. Pat. Appl., 22 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1353388	A2	20031015	EP 2003-7431	20030403
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EP 1353388	A3	20071128		
EP 1353388	B1	20100317		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2004006287	A	20040108	JP 2003-90803	20030328
			<--	
EP 2192632	A1	20100602	EP 2010-154244	20030403
			<--	
R: DE, GB				
US 20030198831	A1	20031023	US 2003-410312	20030409
			<--	
US 7128982	B2	20061031		
US 20070015008	A1	20070118	US 2006-516285	20060906
			<--	
US 7592075	B2	20090922		
PRIORITY APPLN. INFO.:			JP 2002-110303	A 20020412
			<--	
			EP 2003-7431	A3 20030403
			<--	
			US 2003-410312	A3 20030409
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An organic electroluminescence element is disclosed which comprises a hole
transporting layer containing a hole transporting material, a light emission
layer containing a host compound and a phosphorescent compound, a hole
blocking layer, and an electron transporting layer, the host compound having a
band gap of 3.3-5 eV, and having a mol. weight of ≥ 500 , and relation $c < d$
being satisfied, wherein c (eV) represents a difference between energy level

of LUMO in the hole blocking layer and energy level of LUMO in the light emission layer and d (eV) represents a difference between energy level of HOMO in the hole blocking layer and energy level of HOMO in the light emission layer.

IT 439899-44-2

(organic electroluminescent element containing)

RN 439899-44-2 HCAPLUS

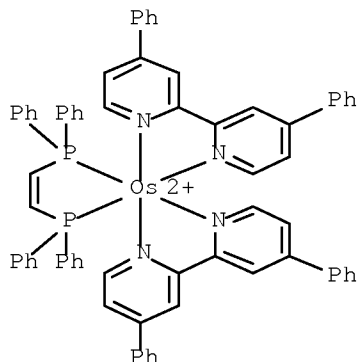
CN Osmium(2+), bis(4,4'-diphenyl-2,2'-bipyridine- κ N1, κ N1') [1,2-ethenediylbis[diphenylphosphine- κ P]]-, (OC-6-22)-, salt with heptafluorobutanoic acid (1:2) (9CI) (CA INDEX NAME)

CM 1

CRN 439899-43-1

CMF C70 H54 N4 Os P2

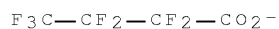
CCI CCS



CM 2

CRN 45048-62-2

CMF C4 F7 O2



IPCI H01L0051-30 [I,A]; H01L0051-05 [I,C*]; H01L0051-00 [I,C]; H01L0051-00 [I,A]

IPCR H01L0051-00 [I,C]; H01L0051-00 [I,A]; H01L0051-05 [I,C*]; H01L0051-30 [I,A]; H01L0051-50 [I,C*]; H01L0051-50 [I,A]

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

ST org electroluminescent device phosphorescent compd
electron hole transporting layer

IT Phosphorescent substances

(in organic electroluminescent element)

IT Band gap

HOMO (molecular orbital)
LUMO (molecular orbital)
(of electron and hole transporting layers in organic
electroluminescent element)

IT Electroluminescent devices
(organic element)

IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 4733-39-5,
2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline 16152-10-6,
4-(1-Naphthyl)-3,5-diphenyl-1,2,4-triazole 31248-39-2 52309-01-0
58328-31-7, 4,4'-Bis(N-carbazolyl)-1,1'-biphenyl 65181-79-5,
2,2'-Dimethyl-4,4'-[N,N'-di(3-methylphenyl)-N,N'-diphenylamino]-1,1'-
biphenyl 88821-71-0 94928-86-6 105465-14-3,
3,3'-Dimethyl-4,4'-[N,N,N',N'-tetrakis(3-methylphenyl)amino]-1,1'-
biphenyl 123847-85-8, α -NPD 149005-33-4 219303-85-2,
2,4,4',4''-Tetrakis(N-carbazolyl)triphenylamine 337526-85-9,
Acetylacetonatobis[2-(2-pyridyl)phenyl]iridium 337526-98-4, Iridium,
tris(benzo[h]quinolin-10-yl- κ C, κ N)-, (OC-6-22)-
343978-78-9 343978-79-0 344796-22-1 344796-24-3 376367-93-0
376367-95-2 387859-70-3 405171-87-1,
N,N-Bis[2,5-dimethyl-4-[(3-methylphenyl)phenylamino]phenyl]-2,5-
dimethyl-N'-(3-methylphenyl)-N'-phenyl-1,4-benzenediamine
405173-85-5 439899-44-2 492446-97-6 497097-21-9
567625-80-3 612519-47-8 612519-52-5 612519-55-8
(organic electroluminescent element containing)

OS.CITING REF COUNT: 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS
RECORD (16 CITINGS)

L64 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2003:32888 HCAPLUS Full-text

DOCUMENT NUMBER: 138:245268

TITLE: New class of hole-blocking amorphous
molecular materials and their application in
blue-violet-emitting fluorescent and
green-emitting phosphorescent organic
electroluminescent devices

AUTHOR(S): Okumoto, Kenji; Shirota, Yasuhiko

CORPORATE SOURCE: Department of Applied Chemistry, Faculty of
Engineering, Osaka University, Yamadaoka, Suita,
Osaka, 565-0871, Japan

SOURCE: Chemistry of Materials (2003), 15(3),
699-707

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

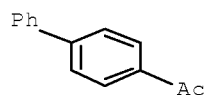
DOCUMENT TYPE: Journal

LANGUAGE: English

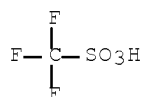
AB A new class of hole-blocking amorphous mol. materials for use in organic
electroluminescent (EL) devices were developed, which include 1,3,5-tri(4-
biphenyl)benzene, 1,3,5-tris(4-fluorobiphenyl-4'-yl)benzene (F-TBB), 1,3,5-
tris(9,9-dimethylfluoren-2-yl)benzene, and 1,3,5-tris[4-(9,9-dimethylfluoren-
2-yl)phenyl]benzene. They readily form stable amorphous glasses with well-
defined glass-transition temps. and are characterized by relatively high
oxidation potentials and large HOMO-LUMO energy gaps. The use of these
materials as hole blockers enabled blue-violet emission from several emitting
amorphous mol. materials with hole-transporting properties in organic EL
devices. A multilayer organic EL device using N,N-bis(9,9-dimethylfluoren-2-
yl)aniline (F2PA) as a blue-violet emitter, F-TBB as a hole blocker, and
4,4',4''-tris[3-methylphenyl(phenyl)amino]triphenylamine and tris(8-
quinolinolato)aluminum as hole and electron transporters, resp., exhibited
blue-violet emission peaking at 405 nm with a high external quantum efficiency
of 1.95%. This device also enabled the doping of a phosphorescent Ir complex,

tris(2-phenylpyridine)iridium (Ir(ppy)₃), tuning the emission color from blue violet to green by excitation energy transfer from F2PA to Ir(ppy)₃.

IT 92-91-1, 4-Acetylbiphenyl 1493-13-6
 (synthesis of TBB; synthesis of organic hole-blocking
 amorphous mol. materials and application in fluorescent and
 phosphorescent organic electroluminescent devices)
 RN 92-91-1 HCAPLUS
 CN Ethanone, 1-[1,1'-biphenyl]-4-yl- (CA INDEX NAME)



RN 1493-13-6 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro- (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s): 22, 72, 76
 ST amorphous hole blocking org material synthesis; fluorescent phosphorescent light emitting device
 IT LUMO (molecular orbital)
 (HOMO gap; of organic hole blocking and light-emitting materials)
 IT HOMO (molecular orbital)
 (LUMO gap; of organic hole blocking and light-emitting materials)
 IT Electronic excitation
 Fluorescence
 (absorption and fluorescence maxima of organic hole blocking and light-emitting materials)
 IT Oxidation potential
 (half-wave; of organic hole blocking and light-emitting materials)
 IT Luminescence, electroluminescence
 (of electroluminescent devices containing organic hole blocking and light-emitting materials)
 IT Glass transition temperature
 HOMO (molecular orbital)
 LUMO (molecular orbital)
 (of organic hole blocking and light-emitting materials)
 IT Half wave potential
 (oxidation; of organic hole blocking and light-emitting materials)
 IT Electroluminescent devices

- Hole (electron)
(synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 50926-11-9, Indium tin oxide
(anode; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 37271-44-6
(cathode; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 6326-64-3P 372956-40-6P 441352-90-5P 441352-91-6P
(hole blocking material; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 65181-78-4, TPD
(light emitting material; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 134008-76-7P 165320-27-4P 246857-02-3P
(light emitting material; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 94928-86-6
(phosphorescent organic electroluminescent device; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 151417-38-8P, 1,3,5-Tris(4-iodophenyl)benzene
(reactant for synthesis of F-TBB, TFPB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 144981-85-1P, 9,9-Dimethyl-2-iodofluorene
(reactant for synthesis of F2PA; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 16218-28-3P, 2,7-Diiodofluorene 355832-04-1P, N-(9,9-Dimethylfluoren-2-yl)aniline
(reactant for synthesis of PFFA; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 612-71-5, 1,3,5-Triphenylbenzene
(synthesis of 1,3,5-tris(4-iodophenyl)benzene; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 7553-56-2, Iodine, reactions 10450-60-9, Periodic acid (H5IO6)
(synthesis of 2-iodofluorene, 2,7-diiodofluorene, 1,3,5-tris(4-iodophenyl)benzene; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 86-73-7, Fluorene

- (synthesis of 2-iodofluorene, 2,7-diiodofluorene; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 74-88-4, Methyl iodide, reactions 865-47-4
(synthesis of 9,9-dimethyl-2-iodofluorene, 9,9-dimethyl-2,7-diiodofluorene; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 2523-42-4P, 2-Iodofluorene
(synthesis of 9,9-dimethyl-2-iodofluorene, 9,9-dimethyl-2,7-diiodofluorene; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 14221-01-3, Tetrakis(triphenylphosphine)palladium
(synthesis of F-TBB, TFB, TFPB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 1765-93-1, 4-Fluorophenylboronic acid
(synthesis of F-TBB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 108-67-8, Mesitylene, uses
(synthesis of F2PA, p-BPD, PFFA; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 7440-50-8, Copper, uses
(synthesis of N-(9,9-Dimethylfluoren-2-yl)aniline, 1,3,5-tris(4-iodophenyl)benzene, PFFA; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 62-53-3, Aniline, reactions
(synthesis of N-(9,9-Dimethylfluoren-2-yl)aniline, F2PA; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 144981-86-2P, 9,9-Dimethyl-2,7-diiodofluorene
(synthesis of N-(9,9-Dimethylfluoren-2-yl)aniline; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 92-91-1, 4-Acetylbiphenyl 1493-13-6
(synthesis of TBB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 333432-28-3
(synthesis of TFB, TFPB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 626-39-1, 1,3,5-Tribromobenzene
(synthesis of TFB; synthesis of organic hole-blocking amorphous mol. materials and application in fluorescent and phosphorescent organic electroluminescent devices)
- IT 2085-33-8, AlQ3 124729-98-2
(synthesis of organic hole-blocking amorphous mol. materials

and application in fluorescent and phosphorescent organic electroluminescent devices)

IT 1591-31-7, 4-Iodobiphenyl 84161-87-5, N,N-Diphenylbenzidine
(synthesis of p-BPD; synthesis of organic hole-blocking
amorphous mol. materials and application in fluorescent and
phosphorescent organic electroluminescent devices)

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Adachi, C	1990	56	799	Appl Phys Lett	HCAPLUS
Baldo, M	1999	75	4	Appl Phys Lett	HCAPLUS
Baldo, M	1999	75	4	Appl Phys Lett	HCAPLUS
Baldo, M	1998	395	151	Nature	HCAPLUS
Chan, L	2001	13	1637	Adv Mater	HCAPLUS
Garten, F	1997	85	1253	Synth Met	HCAPLUS
Grem, G	1992	4	36	Adv Mater	HCAPLUS
Hamada, Y	1992	31	1812	Jpn J Appl Phys	HCAPLUS
Hoshino, S	2000	87	1968	J Appl Phys	HCAPLUS
Hosokawa, C	1995	67	3853	Appl Phys Lett	HCAPLUS
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Ikai, M	2001	79	156	Appl Phys Lett	HCAPLUS
Ishikawa, W	1991		1731	Chem Lett	HCAPLUS
Ishikawa, W	1993	26	B94	J Phys D	HCAPLUS
Jiang, X	2000	76	1813	Appl Phys Lett	HCAPLUS
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Lee, C	2000	77	2280	Appl Phys Lett	HCAPLUS
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Noda, T	1999	11	283	Adv Mater	HCAPLUS
Noda, T	2000	87-89	1168	J Lumin	HCAPLUS
Ogawa, H	1997	91	243	Synth Met	HCAPLUS
Ohmori, Y	1991	30	L1941	Jpn J Appl Phys	
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Robinson, M	2001	11	413	Adv Funct Mater	HCAPLUS
Romero, D	1997	9	1158	Adv Mater	HCAPLUS
Salbeck, J	1997	91	209	Synth Met	HCAPLUS
Shirota, Y	1994	65	807	Appl Phys Lett	HCAPLUS
Shirota, Y	1989		1145	Chem Lett	HCAPLUS
Shirota, Y	2000	122	11021	J Am Chem Soc	HCAPLUS
Shirota, Y	2000	10	1	J Mater Chem	HCAPLUS
Shirota, Y	2000	111-1	387	Synth Met	HCAPLUS
Stolka, M	1984	88	4707	J Phys Chem	HCAPLUS
Tang, B	2001	11	2974	J Mater Chem	HCAPLUS
Ueta, E	1994		2397	Chem Lett	HCAPLUS
Wu, C	2002	81	577	Appl Phys Lett	HCAPLUS
Yang, Y	1996	79	934	J Appl Phys	HCAPLUS
Zou, L	2001	79	2282	Appl Phys Lett	HCAPLUS

OS.CITING REF COUNT: 62 THERE ARE 62 CAPLUS RECORDS THAT CITE THIS
RECORD (65 CITINGS)

August 16, 2010

10/581,005

47

DOCUMENT NUMBER: 137:377262
 TITLE: High efficiency multi-color electro-phosphorescent OLEDs
 INVENTOR(S): D'Andrade, Brian; Thompson, Mark E.; Forrest, Stephen R.
 PATENT ASSIGNEE(S): The Trustees of Princeton University, USA; The University of Southern California
 SOURCE: PCT Int. Appl., 50 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002091814	A2	20021121	WO 2002-US14956	20020513
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WO 2002091814	A3	20030327		
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AU 2002305548	A1	20021125	AU 2002-305548	20020513
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An organic light emitting device is described comprising an anode; a hole transporting layers; an emissive region; an electron transporting layer; and a

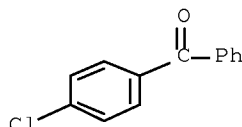
cathode; wherein the emissive region is comprising a host material and a multiple emissive dopants to generate white emission, and wherein the emissive region is comprising a multiple bands and each emissive dopant is doped into a sep. band within the emissive region, and wherein at least one of the emissive dopants emits light by phosphorescence.

IT 134-85-0

(red emission layer; high efficiency multi-color electro-phosphorescent organic LEDs)

RN 134-85-0 HCAPLUS

CN Methanone, (4-chlorophenyl)phenyl- (CA INDEX NAME)



IPCI H01L [ICM]

IPCR C09K0011-06 [I,C*]; C09K0011-06 [I,A]; H01J0001-00 [I,C*]; H01J0001-74 [I,A]; H01J0029-18 [I,C*]; H01J0029-32 [I,A]; H01L0051-50 [I,C*]; H01L0051-50 [I,A]; H05B0033-14 [I,C*]; H05B0033-14 [I,A]

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

ST electro phosphorescence light emitting diode multi color

IT Electroluminescent devices

(high efficiency multi-color electro-phosphorescent organic LEDs)

IT 376367-93-0

(blue phosphor dopant; high efficiency multi-color electro-phosphorescent organic LEDs)

IT 7429-90-5, Aluminum, uses

(cathode; high efficiency multi-color electro-phosphorescent organic LEDs)

IT 94928-86-6

(green emission dopant; high efficiency multi-color electro-phosphorescent organic LEDs)

IT 2085-33-8, Alq3 7789-24-4, Lithium fluoride (LiF), uses 16152-10-6 50851-57-5, Poly(styrene sulfonic acid) 50926-11-9, Indium tin oxide 123847-85-8, α -NPD 126213-51-2, PEDOT 337526-88-2

(high efficiency multi-color electro-phosphorescent organic LEDs)

IT 4733-39-5, 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline

(hole-blocking layer; high efficiency multi-color electro-phosphorescent organic LEDs)

IT 134-85-0

(red emission layer; high efficiency multi-color electro-phosphorescent organic LEDs)

IT 343978-79-0

(red emissive layer dopant; high efficiency multi-color electro-phosphorescent organic LEDs)

RETABLE

Referenced Author	Year	VOL	PG	Referenced Work	Referenced
(RAU)	(RPY)	(RVL)	(RPG)	(RWK)	File


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OS.CITING REF COUNT: 27   THERE ARE 27 CAPLUS RECORDS THAT CITE THIS
                                RECORD (43 CITINGS)

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L64 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2002:221136 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:254380
 TITLE: Organometallic complexes as phosphorescent emitters in organic LEDs
 INVENTOR(S): Thompson, Mark E.; Djurovich, Peter; Lamansky, Sergey; Murphy, Drew; Kwong, Raymond; Abdel-Razzaq, Feras; Forrest, Stephen R.; Baldo, Marc A.; Burrows, Paul E.
 PATENT ASSIGNEE(S): The Trustees of Princeton University, USA; The University of Southern California
 SOURCE: U.S. Pat. Appl. Publ., 77 pp., Cont.-in-part of U. S. Ser. No. 274,609, abandoned.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 5
 PATENT INFORMATION:

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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

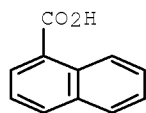
OTHER SOURCE(S): MARPAT 136:254380

AB Emissive layers of organic light-emitting devices are described which comprise a phosphorescent organometallic compound for enhancing the quantum efficiency of the organic light -emitting device. Preferably the emissive mol. is selected from the group of phosphorescent organometallic complexes, including cyclometallated platinum, iridium, and osmium complexes. The organic light-emitting devices optionally contain an exciton blocking layer. In particular, organic light-emitting devices with an emitter layer comprising organometallic complexes of transition metals of formula L2MX, wherein L and X are distinct bidentate ligandss and M is a metal which forms octahedral complexes, are described. A method of making a composition of the formula L2MX is described which entails combining a bridged dimer of formula L2M(μ -Cl)2ML2 with a Bronsted acid XH to make the desired organometallic complex. Display devices incorporating the light-emitting devices are also described.

IT 86-55-5, 1-Naphthoic acid 98-98-6, Picolinic acid 123-54-6, Acetylacetone, reactions (organometallic complexes and their preparation and organic light -emitting devices using them as phosphorescent emitters)

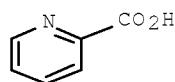
RN 86-55-5 HCAPLUS

CN 1-Naphthalenecarboxylic acid (CA INDEX NAME)



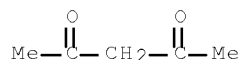
RN 98-98-6 HCAPLUS

CN 2-Pyridinecarboxylic acid (CA INDEX NAME)



RN 123-54-6 HCAPLUS

CN 2,4-Pentanedione (CA INDEX NAME)



INCL 428690000

IPCI H05B0033-14 [ICM,7]; C09K0011-06 [ICS,7]

IPCR C07D0209-00 [I,C*]; C07D0209-86 [I,A]; C09K0011-06 [I,C*]; C09K0011-06 [I,A]; H01L0051-05 [I,C*]; H01L0051-30 [I,A]; H01L0051-50 [I,C*]; H01L0051-50 [I,A]; H01L0051-00 [N,C*]; H01L0051-00 [N,A]

NCL 428/690.000; 252/301.160; 313/504.000; 313/506.000; 428/917.000; 257/102.000; 257/103.000

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 74, 76, 78

ST organometallic compd phosphorescent emitter org
light emitting device

IT Electroluminescent devices

(organic; organometallic complexes and their preparation and organic light-emitting devices using them as phosphorescent emitters)

IT Phosphorescent substances

(organometallic complexes and their preparation and organic light-emitting devices using them as phosphorescent emitters)

IT 2085-33-8, Tris(8-hydroxyquinolino)aluminum 4733-39-5,
2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline 7440-04-2D, Osmium,
compds. with organic ligands 9003-53-6, Polystyrene 25067-59-8,
Polyvinylcarbazole 57102-62-2D, derivs. 58328-31-7 58328-31-7D,
derivs. 88821-71-0 94928-86-6, fac-Tris(2-phenylpyridine)iridium
123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl
180971-61-3 212385-75-6D, derivs. 344406-74-2D, derivs.

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

IT 337526-86-0P 337526-88-2P 337526-89-3P 337526-98-4P
343978-86-9P 343978-88-1P 343978-92-7P 343978-96-1P
343978-99-4P 344426-19-3P

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

IT 110077-26-4P 138736-22-8P 337526-85-9P 337526-87-1P
337526-91-7P 343978-75-6P 343978-76-7P 343978-77-8P
343978-78-9P 343978-79-0P

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

IT ~~86-55-5~~, 1-Naphthoic acid 91-22-5, Quinoline, reactions
95-55-6, 2-Aminophenol ~~98-98-6~~, Picolinic acid 108-86-1,
Bromobenzene, reactions 110-02-1, Thiophene 110-86-1, Pyridine,
reactions ~~123-54-6~~, Acetylacetone, reactions 148-24-3,
8-Hydroxyquinoline, reactions 302-01-2, Hydrazine, reactions
352-93-2, Diethyl sulfide 372-48-5, 2-Fluoropyridine 602-09-5,
2,2'-Dihydroxy-1,1'-binaphthyl 615-36-1 1126-00-7,
1-Phenylpyrazole 3117-65-5 4467-06-5, 2-(p-Tolyl)pyridine
7726-95-6, Bromine, reactions 7758-02-3, Potassium bromide,
reactions 10025-83-9, Iridium trichloride 10025-99-7, Potassium
tetrachloroplatinate 15635-87-7 38215-36-0 53698-49-0,
3-Methoxy-2-phenylpyridine 343978-74-5

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

IT 1008-89-5P, 2-Phenylpyridine 1454-80-4P, 2,2'-Diaminobiphenyl
2436-96-6P, 2,2'-Dinitrobiphenyl 3164-18-9P,
2-(1-Naphthyl)benzoxazole 3319-99-1P, 2-(2-Thienyl)pyridine
13029-09-9P, 2,2'-Dibromobiphenyl 34243-33-9P 57175-14-1P
74866-28-7P, 2,2'-Dibromo-1,1'-binaphthyl 109306-86-7P
116563-45-2P 343978-82-5P 343978-90-5P

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

IT 15337-84-5P 15442-57-6P, cis-Dichlorobis-(diethyl sulfide)platinum
128025-34-3P

(organometallic complexes and their preparation and organic light
-emitting devices using them as phosphorescent
emitters)

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